December 12, 2002

Thomas Hannigan, Director
California Department of Water Resources
1416 9th Street, 11th Floor
Sacramento, California 95814

Dear Director Hannigan:

Attached is the final California Floodplain Management Task Force "California Floodplain Management Report." These consensus recommendations reflect the members' commitment to public safety and the State's agricultural, economic, and environmental resources. Implementing these recommendations will help California residents live and work in a safer, healthier, and more productive State.

Task Force members represented local and State jurisdictions, agriculture, building and real estate industries, environmental and emergency management organizations, and Native Americans. Our diverse interests included flood protection, ecosystem health, economic development, conservation of agricultural lands, housing, local land-use authority, public trust, and private property rights. Representatives of federal agencies provided insight and advice to the group.

The Task Force had available to it recommendations from 39 previous reports, including the *Flood Emergency Action Team Report* (FEAT Report), *Sharing the Challenge – Floodplain Management into the 21st Century* (the "Galloway Report"), government agency publications, books, published papers, Web sites, and specific recommendations from Task Force members. Over 30 Task Force small work group meetings and six public plenary sessions were held between April and December of 2002 to achieve consensus on the recommendations presented in the attached report.

Our recommendations are focused on floodplain management and are organized into three categories: Better Understanding of and Reducing Risks from Reasonably Foreseeable Flooding; Multi-Objective Management Approach for Floodplains; and Local Assistance, Funding, and Legislation. The Task Force also recognized that floodplain management measures interrelate, frequently overlap, and often rely on other floodwater management measures to reduce losses within the floodplain. This is especially pressing within the context of the growing understanding of climate change and the ramifications for location, amount, and temporal impact to California's snowpack and snowmelt. History shows that pursuing floodplain management or floodwater management without melding the two in a multi-objective context may be less effective and ultimately more costly with respect to achieving public safety and ecosystem health.

The Task Force took note of the Federal Emergency Management Agency's (FEMA) concerns about California's compliance status with FEMA's National Flood Insurance Program (NFIP), recognized that there may be risks to the State if FEMA finds the State out of compliance, and makes a number of recommendations to the State and its political subdivisions aimed at addressing NFIP standards.

We believe that proper funding sources will be essential to implementing the recommendations addressed in this report. The State should examine and use all available resources and consider what resources will be available in the future.

While the Task Force completed a remarkable amount of work in a short time, several issues remain for further discussion. We believe there is an ongoing role for our group, or a group similar to ours, to provide advice beyond what we have accomplished. We encourage the Department to explore new funding sources to continue efforts similar to those performed by this Task Force.

As a final note, we want to thank you for your leadership as chair and the excellent staff, consultant, and facilitator support you provided to this process. We hope to provide continuing support to the Department and look forward to your next steps as you consider our recommendations.

Sincerely,

The California Floodplain Management Task Force

Signatories

Hon. Gregory Zlotnick, **Co-Vice Chair** Association of California Water Agencies; Director, Santa Clara Valley Water District	**Leslie Friedman-Johnson**, **Co-Vice Chair** The Nature Conservancy
Adams, **Christopher** Office of Emergency Services	**Bornstein**, **Julie** Department of Housing and Community Development
Callahan, **Michael** California State Association of Counties - County of San Joaquin	**Coglianese**, **Hon. Marci** League of California Cities - City of Rio Vista
Cole, **Linda** Community Alliance with Family Farmers	**Davis**, **Tom** Agua Caliente Tribe
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Hardesty, **T. Michael** California Central Valley Flood Control Association

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Young, **Russell** California Farm Bureau Federation

California Floodplain Management Report

Recommendations of the
California Floodplain Management
Task Force

December 12, 2002

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California Floodplain Management Task Force Membership List

Thomas Hannigan **Task Force Chair**	The Department of Water Resources
Hon. Gregory Zlotnick **Task Force Co-Vice Chair**	Association of California Water Agencies; Director of Santa Clara Valley Water District
Leslie Friedman-Johnson **Task Force Co-Vice Chair**	The Nature Conservancy
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Young, Russell	California Farm Bureau Federation

Federal Advisory Committee

Butterwick, Mary	U.S. Environmental Protection Agency, Region 9
Charlton, Mark	U.S. Army Corps of Engineers
Draheim, Shanna	U.S. Environmental Protection Agency, Region 9
Eldridge, Jack	Federal Emergency Management Agency, Region IX
Hoover, Michael	U.S. Fish and Wildlife Service
Lenaburg, Ray	Federal Emergency Management Agency, Region IX
Lent, Rebecca	National Marine Fisheries Service
McKenzie, Cynthia	Federal Emergency Management Agency, Region IX
Nastri, Wayne	U.S. Environmental Protection Agency, Region 9

Executive Summary

In 2000, Governor Gray Davis signed Assembly Bill 1147, which recommended the creation of the California Floodplain Management Task Force (Task Force).

Floodplain Management

Floodplain management includes actions to the floodplain to reduce losses to human resources within the floodplain and/or protect benefits to natural resources associated with floodplains and flooding. Sample actions include:

1. Minimizing impacts of flows;
2. Maintaining or restoring natural floodplain processes;
3. Removing obstacles within the floodplain voluntarily or with just compensation;
4. Keeping obstacles out of the floodplain
5. Educating and planning for emergency preparedness; and
6. Ensuring that operations of floodwater management systems are not compromised by activities that interfere with, or are damaged by, design floods of these systems.

In February 2002, the Governor delegated authority to the Department of Water Resources (DWR) to convene a Floodplain Management Task Force. The Task Force focused on the intent of Assembly Bill (AB) 1147. In this bill "The Legislature finds and declares that the impacts of flooding can be reduced through better coordination of floodplain management decisions. It is the intent of the Legislature that the Governor establish a floodplain management task force with broad membership from the local, state, and federal government and stakeholders with an interest in flood control. If the task force is established, it is the intent of the Legislature that it examine specific issues related to state and local floodplain management, including, but not limited to, features that substantially reduce potential flood damages, and make recommendations for more effective statewide floodplain management policies."

The newly formed Task Force sought to recommend floodplain management strategies designed to reduce flood losses and maximize the benefits of floodplains. The Task Force found that existing programs are inadequate to accomplish these goals and that time is of the essence. They moved forward with an understanding that failure to take action may result in loss of life, increased economic, agricultural, and property losses, continued environmental decline, and the need for ecosystem restoration.

The Task Force identified the need for the State of California to comply with the National Flood Insurance Program (NFIP). It also developed recommendations for improving floodplain management by adopting Best Management Practices (BMPs) and integrating multi-objective-management (M-O-M) approaches.

In developing its recommendations, the Task Force considered an array of previously identified options drawn from thirty nine reports on the subject, including the *Flood Emergency Action Team Report* (FEAT Report) (Resources Agency of California, 1997) and *Sharing the Challenge - Floodplain Management into the 21st Century* ("Galloway Report") (Interagency Floodplain Management Review Committee, 1994), and from government agency publications, books, published papers, Web sites, and specific recommendations from stakeholders. Recommendations developed along three basic themes:

- **Better Understanding of and Reducing Risks from Reasonably Foreseeable Flooding -** Local, State and federal agencies should consider the risk to life and property from reasonably foreseeable floods when making their land use and floodplain management decisions. To accomplish this objective, decision makers need better information and improved tools. In addition, better tools are needed to comply with the federal National Flood Insurance Program.

Reasonably Foreseeable Flood

A reasonably foreseeable flood is a flood event that is realistically probable for a particular area. In many cases, this event could exceed a predicted "100-year" flood. It is important to note that the determination of a reasonably foreseeable flood can vary depending on its use and application for any given area. Sources of information on reasonably foreseeable floods may include historic floods, paleo-floods, hydrologic modeling using transposition, historical flood damage data, and hydrologic models. Communities such as Sacramento, West Sacramento, Yuba City, Marysville, Los Angeles, and Orange County are all working toward protection against floods that exceed the "100-year flood." It is up to each community to consider all information on reasonably foreseeable floods in making land-use and flood management decisions.

- **Multi-Objective-Management Approach for Floodplains -** State, local, and federal agencies should implement multi-objective floodplain management on a watershed basis. Where feasible, projects should provide adequate protection for natural, recreational, residential, business, economic, agricultural, and cultural resources and for water quality and supply.

- **Local Assistance, Funding, and Legislation** - DWR should identify and actively pursue funding opportunities, technical assistance to local governments and other organizations, and legislative proposals to implement Task Force recommendations and ensure successful floodplain management, recognizing that local governments have the primary responsibility and authority for land use decisions.

An additional but key element was to establish a common understanding of the issues, terms, and definitions associated with floodplain management. The language associated with floodplain management often varies among different professional disciplines and governmental bodies. Defining terms became a critical element of Task Force discussion. Table 1 of the introduction includes the working terms and definitions used by the group for this process.

The Task Force's consensus recommendations are not in priority order and are summarized hereafter.

Better Understanding of and Reducing Risks from Reasonably Foreseeable Flooding

1. **Awareness Floodplain Mapping -** The State should expand its Awareness Floodplain Mapping Program for use by local governments and the public.

2. **Future Build-Out Mapping -** Local and State agencies preparing floodplain maps should consider current and future planned development.

3. **Watershed-Based Mapping -** Wherever practical, floodplain maps should be prepared on a watershed basis.

4. **Geographic Information System (GIS)-Based Flood Maps -** Local, State, and federal agencies should create, develop, produce, and disseminate compatible GIS-based flood maps.

5. **Alluvial Fan Floodplains -** Priority for alluvial fan floodplain mapping should be given to those alluvial fan floodplains being considered for development. The State should convene an alluvial fan task force to review information on alluvial fan floodplains, determine future research needs, and develop recommendations specific to alluvial fan floodplain management.

6. **Stream Gaging and Monitoring -** DWR and other agencies should sponsor projects in cooperation with the United States Geological Survey (USGS) to install real-time gages in priority locations throughout California.

7. **Repetitive Losses -** Local agencies should work with the Governor's Office of Emergency Services (OES) and DWR to identify repeatedly flooded structures and inform qualifying residents of voluntary programs to prevent future flood losses.

8. **Flood Warning and Local Community Flood Response Programs -** The State should increase assistance to local agencies to improve flood-warning programs specific to each watershed.

9. **Flood Insurance Rate Map Issues –** Decision-makers should gather information and data beyond Flood Insurance Rate Maps (FIRMs) to better assess reasonably foreseeable floods.

10. **Exceeding NFIP Floodplain Management Requirements -** Local communities should be encouraged to require new and substantially improved buildings to have their lowest floor elevations to be at least one foot above the NFIP's base flood elevation, factoring in the effect of full build out of the watershed. The effects of new or additional flood management measures should be reflected in an updated base flood elevation.

11. **Executive Order -** The Governor's 1977 Executive Order should be updated.

12. **State Multi-Hazard Mitigation Plan -** DWR, OES, and other agencies should incorporate into the State Multi-Hazard Mitigation Plan floodplain management measures that will meet Federal Emergency Management Agency (FEMA) requirements.

13. **Multi-Hazard Mapping -** OES should coordinate with other hazard mapping efforts to develop GIS-based multi-hazard advisory maps and distribute them to local governments and the public.

14. **State Building Codes –** Ensure that the California Building Standards Code meets, at minimum, NFIP requirements. Ensure that other State codes applicable to public buildings meet, at a minimum, NFIP requirements. Ensure that any local code adoptions or amendments and any development approvals meet, at a minimum, NFIP requirements.

Multi-Objective-Management Approach for Floodplains

15. **Multi-Objective-Management -** A M-O-M approach to flood management projects should be promoted.

16. **Flood Management Approaches to Ecosystem Restoration and Agricultural Conservation -** Flood management programs and projects, while providing for public safety, should maximize opportunities for agricultural conservation and ecosystem protection and restoration, where feasible.

17. **Nonstructural Approaches, Restoration, and Conservation of Agriculture and Natural Lands-** In planning new or upgraded floodwater management programs and projects, including structural projects, local and state agencies should encourage as part of the design, where appropriate, nonstructural approaches and the conservation of beneficial uses and functions of the floodplain.

18. **Tools for Protection of Flood Compatible Land Uses -** The State should identify, develop, and support tools to protect flood-compatible land uses.

19. **Protection of Floodplain Groundwater Recharge Areas -** Permitting agencies should consider the impacts of land-use decisions on the capacity of the floodplain to recharge groundwater.

20. **Vector Control –** During the planning and development of ecosystem restoration projects, the costs and impacts involved with vector control and with monitoring related to mosquito-transmitted diseases should be considered.

21. **Multi-Jurisdictional Partnerships -** The State should encourage multi-jurisdictional partnerships when floodplain management projects are planned and implemented.

22. **Watershed Monitoring -** The State and others should financially support the monitoring of flood management projects on a watershed level.

23. **Proactive and Adaptive Management of Floodplains -** State and local agencies should manage floodplains proactively and adaptively by periodically adjusting to current physical and biological conditions, new scientific information, and knowledge.

24. **Best Management Practices -** DWR should work with stakeholders to identify, monitor, and update voluntary BMPs for multi-objective floodplain management.

25. **Training, Education, and Professional Certification for Multi-Objective Floodplain Management -** The State should encourage the inclusion of multi-objective floodplain management curricula in college and university degree programs.

26. **Coordination among Agencies and Groups -** The State should encourage and create incentives for additional coordination among stakeholders.

27. **State General Plan Guidelines -** The *State General Plan Guidelines* should be updated to reflect the California Floodplain Management Task Force recommendations, as applicable, and to reflect other programs, policies, and standards, including the NFIP, for floodplain management.

Local Assistance, Funding, and Legislation

28. **New and Existing Funding Sources -** The State and local governments should encourage federal, State, local, nongovernmental, and other private cost sharing to achieve equitable and fair financing of multi-objective floodplain management actions and planning.

29. **Task Force Recommendation Priorities -** DWR and The Reclamation Board should lead the development of a consensus process, involving appropriate stakeholders, to identify criteria and prioritize the implementation of Task Force recommendations, given the expected expenditures, using existing and new funding sources.

30. **Department of Water Resources Outreach Programs –** DWR should expand outreach programs to include public service announcements to increase public awareness of floodplain values, flooding hazards, public safety, and hazard mitigation measures.

31. **Designated Floodways -** DWR and The Reclamation Board should include, in the Community Assistance Workshops, information on the Reclamation Board's current authority to adopt and update designated floodways in the Central Valley. The Reclamation Board should work with stakeholders to identify, if any, a list of Reclamation Board regulations that are impediments to flood-compatible uses within the floodway and recommend specific revisions.

32. **State Floodplain Management Assistance to Local Governments -** The State should provide additional resources to continue and expand implementation of the State's floodplain management programs, including full support of the Community Assistance Contact program.

33. **National Flood Insurance Program Compliance Encouragement –** Public agencies not subject to local government floodplain management requirements or the Governor's Executive Order on Floodplain Management should comply with NFIP requirements.

34. **Community Rating System –** DWR should educate local officials and the public about the elements and benefits of the Community Rating System (CRS) insurance-rate adjusting program.

35. **State Community Rating System Program Coordinator -** DWR should designate a State level CRS Program Coordinator familiar with State agencies and local governments that use the CRS program.

36. **Interagency Barriers -** The Reclamation Board should work with the Corps of Engineers, State agencies, local sponsors and interested parties to identify interagency barriers to efficient implementation of multi-objective flood management projects and to develop options to overcome those interagency barriers.

37. **California Environmental Quality Act Local Analysis Improvement –** DWR should provide technical assistance to local agencies and practitioners with a practical, step-by-step CEQA flood hazard and impacts assessment guide. The CEQA Guidelines, Appendix G, should be modified to include the changes shown in Appendix D of this report.

38. **Establishment of a California Floodplain Management Advisory Committee -** DWR should sponsor a floodplain management advisory committee composed of local and State government representatives, floodplain managers, and other stakeholders, to develop additional recommendations to improve floodplain management practices.

The Task Force worked with and considered diverse and conflicting interests and developed many consensus recommendations. None of the Task Force recommendations in the report preclude Task Force organizations or their members from raising issues that differ from items in the report.

Due to the time, nature, and format of the Task Force and the numerous issues related to floodplain management, it was not reasonably possible to form recommendations on all of the issues identified as important by the Task Force members. In some cases, issues were not discussed; others were discussed, but no consensus emerged; and more definitive resolution of some issues was deferred to subsequent analysis and discussion processes recommended by the Task Force.

Examples of these three types of remaining issues include: coastal floodplain management, some elements of alluvial fan floodplain management, elements of the effort to ensure that the State is judged to be in full compliance with the NFIP, floodwater management, floodwater storage, floodplain management programs in protected floodplains still subject to flooding, certification of the competence of floodwater management systems for floodplain management purposes, life-cycle costing, disclosure and map availability, actions to conserve agriculture and rural floodplains, urbanization of floodplains, benefits and risks to floodplains from structural flood control, and methods needed to address adverse impacts to adjacent property.

These topics are important and worthy of discussion by future State task forces, appropriate State and local agencies, and the Legislature.

CHAPTER I

INTRODUCTION

Introduction

Floodplain management involves proactive measures to obtain maximum benefits and minimize losses associated with flooding.

Flooding is an important ecological function of every river, alluvial fan, and coastal area in California. Flooding has seasonally inundated California for thousands of years, generating unique ecosystems. Floodplain ecosystems provide essential habitat for multiple species of plants and wildlife (some dependent on the recurrence of periodic flooding), and there are economic, ecological, agricultural, and societal benefits to maintaining connections between rivers, bays, and coasts and their floodplains.

Floodplain
Any land area susceptible to inundation by floodwaters from any source.

At the same time, floods also cause loss of life, property, and economic activity. In January 1997, California experienced one of the most geographically extensive and costly floods in the State's history. Of the State's 58 counties, 48 were declared disaster areas. Nine people were killed, 120,000 people were evacuated from their homes, and 300 square miles were flooded. Damages approached $2 billion, and floods impacted over 23,000 homes as well as numerous businesses, agricultural lands, bridges, roads, and floodwater management infrastructures. Estimated indirect costs and costs associated with the disruption of the State's economy exceeded $5 billion.

While it was the most costly, the 1997 flood was not the most deadly. Previous floods caused 74 deaths in 1955, 35 deaths in 1964 (11 from a tsunami), 13 deaths in 1986, and 28 deaths in 1995. Since 1950, all 58 California counties have been declared flood disaster areas *at least three times*. The 1995 and 1997 floods prompted the initiation of a Governor's Flood Emergency Action Team (FEAT) and a recommendation for the development of a statewide task force composed of broadly represented key stakeholders.

In 2000, Governor Gray Davis signed Assembly Bill (AB) 1147, which recommended the creation of the California Floodplain Management Task Force (Task Force).

In February 2002, the Governor delegated authority to the Department of Water Resources (DWR) to convene a Floodplain Management Task Force. The Task Force focused on the intent of AB 1147. The bill states, "The Legislature finds and declares that the impacts of flooding can be reduced through better coordination of floodplain management decisions. It is the intent of the Legislature that the Governor establish a floodplain management task force with broad membership from the local, state, and federal government and stakeholders

with an interest in flood control. If the task force is established, it is the intent of the Legislature that it examine specific issues related to state and local floodplain management, including, but not limited to, features that substantially reduce potential flood damages, and make recommendations for more effective statewide floodplain management policies."

The newly formed Task Force sought to recommend floodplain management strategies designed to reduce flood losses and maximize the benefits of floodplains. The Task Force found that existing programs are inadequate to accomplish these goals, and that time is of the essence. They moved forward with an understanding that failure to take action may result in loss of life, increased economic, agricultural, and property losses, continued environmental decline, and the need for ecosystem restoration.

Between April and December of 2002, the Task Force held over 30 small group meetings and 6 public plenary sessions to achieve consensus on the recommendations presented in this report.

Floodplain Management

Floodplain management includes actions to the floodplain to reduce losses to human resources within the floodplain and/or protect benefits to natural resources associated with floodplains and flooding. Sample actions include:

1. Minimizing impacts of flows;
2. Maintaining or restoring natural floodplain processes;
3. Removing obstacles within the floodplain voluntarily or with just compensation;
4. Keeping obstacles out of the floodplain;
5. Educating and planning for emergency preparedness; and
6. Ensuring that operations of floodwater management systems are not compromised by activities that interfere with, or are damaged by, design floods of these systems.

In developing their recommendations, the Task Force considered an array of previously identified options drawn from 39 reports on the subject, including the *Flood Emergency Action Team Report* (FEAT Report) (Resources Agency of California, 1997) and *Sharing the Challenge - Floodplain Management into the 21st Century* ("Galloway Report") (Interagency Floodplain Management Review Committee, 1994), and from government agency publications, books, published papers, Web sites, and specific recommendations from stakeholders. Recommendations were developed along three basic themes:

- **Better Understanding of and Reducing Risks from Reasonably Foreseeable Flooding** – Local, State and federal agencies should consider the risk to life and property from reasonably foreseeable floods when making their land-use and floodplain management decisions. To effectively consider the risk to life and property from reasonably foreseeable floods, decision-makers need better tools and information and specific methods to comply with the federal National Flood Insurance Program (NFIP).

- **Multi-Objective-Management Approach for Floodplains** – State, local, and federal agencies should implement multi-objective floodplain management on a watershed basis. Where feasible, projects should provide adequate protection for natural, recreational, residential, business, economic, agricultural, and cultural resources and for water quality and supply.

- **Local Assistance, Funding, and Legislation** – DWR should identify and actively pursue funding opportunities, technical assistance to local governments and other organizations, and legislative proposals to implement Task Force recommendations and ensure successful floodplain management, recognizing that local governments have the primary responsibility and authority for land-use decisions.

Reasonably Foreseeable Flood

A reasonably foreseeable flood is a flood event that is realistically probable for a particular area. In many cases, this event could exceed a predicted "100-year" flood. It is important to note that the determination of a reasonably foreseeable flood can vary depending on its use and application for any given area. Sources of information on reasonably foreseeable floods may include historic floods, paleo-floods, hydrologic modeling using transposition, historical flood damage data, and hydrologic models. Communities such as Sacramento, West Sacramento, Yuba City, Marysville, Los Angeles, and Orange County are all working toward protection against floods that exceed the "100-year flood." It is up to each community to consider all information on reasonably foreseeable floods in making land use and flood management decisions.

An additional but key element was to establish a common understanding of the issues, terms, and definitions associated with floodplain management. The language associated with floodplain management often varies among professional disciplines and governmental bodies. Defining terms became a critical element of the Task Force discussion. Table 1 includes the working terms and definitions used by the group for this process.

The group grew to appreciate the knowledge, wisdom, and thoughtfulness of its members. Through long hours of work and deliberation, it was possible to create common ground and recommendations that will benefit all Californians if implemented.

Table 1

TERMS

Flood management is an overarching term that encompasses both floodwater management and floodplain management.

Floodwater management includes actions to modify the natural flow of floodwaters to reduce losses to human resources and/or protect benefits to natural resources associated with flooding. Sample actions include:

1. Containing flows in reservoirs, dams, and natural basins;
2. Conveying flows via levees, channels, and natural corridors;
3. Managing flows through reservoir re-operation; and
4. Managing watersheds by decreasing rainfall runoff and providing headwater stream protection.

Floodplain management includes actions to the floodplain to reduce losses to human resources within the floodplain and/or to protect benefits to natural resources associated with floodplains and flooding. Sample actions include:

1. Minimizing impacts of flows (e.g., flood-proofing, insurance);
2. Maintaining or restoring natural floodplain processes (e.g., natural community succession, meander corridors);
3. Removing obstacles within the floodplain voluntarily or with just compensation (e.g., relocating at- risk structures);
4. Keeping obstacles out of the floodplain (e.g., planning, mapping, and zoning land-use decisions);
5. Educating and planning for emergency preparedness (e.g., emergency response plans, data collection, outreach, insurance requirements); and
6. Ensuring that operations of floodwater management systems are not compromised by activities that interfere with, or are damaged by, design floods of these systems.

Floodplain management measures interrelate and frequently overlap with floodwater management measures, such as the following, to reduce losses within the floodplain:

1. Emergency response activities;
2. Realigning levees;
3. Reconnecting historical floodplains; and
4. Re-operation of reservoirs.

CHAPTER II

FLOODPLAIN MANAGEMENT

KEY ISSUES

Floodplain Management - Key Issues

The Task Force identified the three major impediments to effective floodplain management: Insufficient understanding of the risks from reasonably foreseeable flooding; single-purpose approaches to floodplain management issues; and insufficient technical assistance and funding to local agencies.

Insufficient Understanding of the Risks from Reasonably Foreseeable Flooding

The first challenge to effective floodplain management is the misunderstanding by the public and decision-makers of the real risks of flooding.

The phrase "100–year flood" is a concept used by the NFIP to calculate flood insurance premium thresholds and rates. Many people have heard the term 100-year flood, and they believe that it means their home will not be flooded for 100 years. In actuality, the 100-year flood is a flood with a one percent chance of occurrence each year. It is therefore possible that a 100-year flood or larger can occur more than once per year or in back-to-back years. In other words, over the lifetime of a 30-year mortgage, there is a 26 percent chance of being flooded by a 100-year flood.

Many communities use the 100-year flood as the basis for making floodplain management decisions, whereas, in truth, they may still experience floods of larger magnitudes. In these circumstances, floodplain management decisions based on the 100-year flood may fail to achieve the expected goals of preventing flood damage and loss of life.

Areas that have a designed protection from the 100-year flood are not protected from more severe floods. An increasing number of communities, including Sacramento, West Sacramento, Yuba City, Marysville, Los Angeles, and Orange County, are working toward protection against floods that exceed the 100-year flood.

Another problem the public experiences is that areas identified as flood-prone keep changing. One year, a property is considered to be outside of the regulated floodplain; a few years later, the same property may be considered in the regulated floodplain, perhaps requiring owners to pay for flood insurance. There are several reasons for such changes. The modeled hydrology of a watershed may change. For example, since the 100-year flood is a hypothetical flood magnitude that is derived from mathematical procedures using existing storm and stream flow records, it changes as the amount of flood data accumulates through the years.

Sometimes the way in which the watershed is modeled is changed as updated assessments of floodplain topography, stage/flow relationships, and ways of modeling the performance of floodwater management systems are implemented. In other cases, the watershed itself changes. For example, in many areas of the State, maps of flood-prone areas only reflect the impacts of current development in that watershed. As new development occurs, more hard surfaces, such as roads and roofs, accelerate and increase flood runoff, increasing the size and often the depth of the floodplain. The problem is compounded by the use of California floodplain maps that do not reflect today's development in many areas. On the average, these maps have not been updated for over a decade. In addition, there are thousands of square miles of floodplains that have not been mapped at all.

Currently, many communities allow the lowest floor of new residences to be constructed at the 100-year base flood elevation, as shown on Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRMs). The mapping technology and methods used to map and define base flood elevation are, at best, accurate to only plus or minus one foot. In addition, changes in the watershed can alter the level of flooding shown on the issued FIRMs. Therefore, residences built to minimum standards are subject to damages from the 100-year flood as encroachment takes place in the watershed.

Alluvial fans present unique challenges to floodplain management. Alluvial fan flooding is unpredictable, given its geologic and geomorphic nature. The principal hazards associated with alluvial fan flooding are the high velocity, debris-laden flows and the uncertainty of the flow path. Many of the alluvial fan floodplains in Southern California have experienced development and are projected for additional development. To prevent future loss of life and damage to property, it is important that alluvial fans throughout the State be accurately identified, and that landforms be evaluated to identify fan surfaces subject to flooding.

Alluvial Fan
An alluvial fan is a gently sloping, fan-shaped landform created over time by the deposition of eroded sediment. Alluvial fans are common at the base of mountain ranges in arid and semiarid regions, such as the American West.

For riverine and coastal flooding, bank stabilization is frequently used to protect developed areas. However, for alluvial fan flooding, this approach can actually concentrate flood risks in neighboring areas.

Repetitive losses within California's floodplains are another problem. Repetitive losses are defined by FEMA as two or more losses that occur to the same property within a 10-year period. Approximately 40 percent of all FEMA's NFIP claims nationally result from repetitive losses.

Many of the areas where repetitive flooding has occurred remain unmapped and unregulated. Consequently, flood management measures to reduce loss of life and property damage in these areas are seldom practiced.

Although programs are available to assist homeowners in reducing repetitive losses, many communities do not take advantage of them.

California's policies for building State facilities within floodplains have not been updated for 25 years. Therefore, the policies do not reflect current knowledge of the risks associated with such development. Furthermore, these policies fail to direct State agencies owning structures or property in floodplains to cooperate with other stakeholders in multi-objective floodplain management.

FEMA has notified the State that its existing Executive Order for floodplain management issued in 1977 does not effectively bring the State and its political subdivisions into compliance with the NFIP. According to FEMA, continued noncompliance could endanger the State's ability to obtain federal financing from FEMA and other federal sources for State building construction and improvement projects located in floodplains and for disaster recovery.

California faces multi-faceted challenges associated with the impacts of climate change. Recent scientific studies suggest that climate changes might increase flood frequency and could exacerbate the uncertainty of flood-flow prediction. California's dependence on reservoir storage and snow pack for flood management and water supply make the State particularly vulnerable to these potential changes. Climate change could impact regional hydrology and hydraulics directly, resulting in an increase in temperature, rise in sea level, change in precipitation patterns, and changes in storm frequency and intensity.

Single-Purpose Approaches to Floodplain Management Issues

In the past, many projects within floodplains have been developed and implemented to carry out single-purpose objectives, without considering the importance of flooding in maintaining a healthy environment. Conversely, some ecosystem restoration projects have been implemented without sufficient consideration of long-term floodway maintenance requirements. While achieving single-purpose objectives, these approaches may have adversely impacted other beneficial uses of the floodplains.

While single-purpose flood management projects were acceptable in the past, they no longer are considered the preferable approach to floodplain management. Increasingly, floodplains are seen as valuable resources by our society. They provide opportunities for flood protection, agricultural production, open space, valuable native habitat, ecosystem protection, recreation, economic development, and housing.

Financial limitations are another disadvantage of single-purpose projects. Governmental agencies and the private sector typically do not have the resources or public support to fund projects that do not achieve multiple benefits. In recognition of these limitations, greater incentives are now available for multi-objective projects.

AB 1147, which authorized the creation of the Task Force, provides significant financial incentives for multi-purpose flood management projects that also address ecosystem and recreational needs. The Safe Drinking Water, Watershed Protection, and Flood Protection Act of 2000 (Proposition 13) funded projects that combine flood protection with agricultural conservation and ecosystem protection. The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Proposition 50) contains additional incentives for watershed-based management approaches.

Insufficient Technical Assistance and Funding to Local Agencies

Local governments have the primary responsibility and authority for regulating land development. However, in most cases, they lack the necessary resources to fully implement floodplain management strategies. Information on the numerous potential funding sources available for implementing floodplain management strategies is difficult to access.

Unlike other issues of statewide concern, there is no unified public information or education program for floodplain management. Independently, each agency has had to develop public awareness programs and disseminate information on all floodplain values, flooding hazards, public safety and hazard mitigation measures.

One important program that assists local areas is FEMA's Community Assistance Program (CAP), which is administered and cost-shared by DWR and FEMA. This program, which includes technical assistance and incentives for enhanced floodplain management, could provide the critical assistance needed by local communities to develop multi-objective floodplain management. Currently, CAP funding is insufficient to provide this assistance to communities in need.

Without specific legislative authority, the State's ability to participate in and leverage federal and local cost-share funds for multi-objective flood management projects in limited. As a result, the State is unable to fully support its interests in ecosystem restoration, responsible floodplain management, and comprehensive flood management planning.

In response to the challenges mentioned above, the Task Force presents recommendations in Chapter III for providing local governments, landowners, and others with floodplain management tools to maximize the benefits of floodplains and minimize flood-related losses.

CHAPTER III

RECOMMENDATIONS

Recommendations

Recommendations for Better Understanding of and Reducing Risks from Reasonably Foreseeable Flooding

Most residents generally expect that the government will protect their communities from reasonably foreseeable flood events. Reasonably foreseeable floods are floods that are realistically probable for a particular area; often, they may exceed a predicted 100-year flood. The determination of a reasonably foreseeable flood can vary depending on its use and application for any given area. The communities of Sacramento, West Sacramento, Yuba City, Marysville, Los Angeles, and Orange County are all working toward protection against floods that exceed the often discussed 100-year flood.

To provide protection from reasonably foreseeable floods, communities need information to predict those flood flows. Sources of relevant information may include historic flood and damage data, paleo-flood data, and the results of hydrologic, hydraulic, and meteorological models, including hydrologic modeling using transposition. Communities may find this information valuable in making land-use and flood management decisions. Once they identify reasonably foreseeable flood flows, they can consider a variety of flood management tools for protecting their residents. This will enable them to meet community priorities for flood protection, economic development, housing, agricultural conservation, ecosystem protection and restoration, open space, and recreation.

SUMMARY OF THE RECOMMENDATIONS

Local, State and federal agencies should consider the risk to life and property from reasonably foreseeable floods when making their land use and floodplain management decisions. To accomplish this objective, decision makers need better information and improved tools. In addition, better tools are needed to comply with the federal National Flood Insurance Program.

Recommendations

1. AWARENESS FLOODPLAIN MAPPING

Problem: In the coming decades, it is projected that millions of additional Californians will be living in flood-prone areas. Many communities do not have current information to use in identifying and characterizing areas subject to inundation by reasonably foreseeable floods. DWR has a small Awareness Floodplain Mapping Program, but its funding is expiring. Awareness floodplain mapping is a cost-effective solution to mapping areas that otherwise would not be mapped through the FEMA mapping program.

Recommendation: The State should continue DWR's current non-regulatory Awareness Floodplain Mapping Program to analyze all flood-prone developing areas in California, for optimal use by local government. DWR should expand its Awareness Floodplain Mapping Program to provide information on areas that are subject to inundation by reasonably foreseeable floods, for use by local communities. DWR should provide awareness floodplain maps and other flood hazard information for use by local governments and the public.

2. FUTURE BUILD-OUT MAPPING

Problem: Future build-out is not always included on maps used to identify flood-prone areas. As future development occurs, runoff from that development can increase flows in flood-prone areas downstream. This is one of the reasons why levels of protection decrease; one year an area may have 100-year flood protection, and the next year the same area may have less than 100-year flood protection.

Recommendation: Local and State agencies preparing floodplain maps should incorporate consideration of current and future planned development, pursuant to the local General Plan. If new or additional floodwater management measures are implemented in the future, their impacts also should be reflected in updated floodplain maps.

3. WATERSHED-BASED MAPPING

Problem: Many floodplain maps are prepared based on political boundaries (e.g., city, county, or agency), not on watershed boundaries. Different jurisdictions frequently use different floodplain mapping data and methods. These different standards lead to inconsistencies in floodplain mapping and limit the ability to do comprehensive floodplain management.

Recommendation: Wherever practical and appropriate, floodplain maps should be prepared on a watershed basis.

4. GEOGRAPHICAL INFORMATION SYSTEM-BASED FLOOD MAPS

Problem: Insufficient, inadequate, and incompatible Geographical Information System (GIS) data make the integration of floodplain information more difficult for local jurisdictions engaged in comprehensive planning.

Recommendation: Local, State, and federal agencies should create, develop, produce, and disseminate compatible GIS-based flood maps.

5. ALLUVIAL FAN FLOODPLAINS

Problem: Unlike flows in riverine or coastal floodplains, flows in alluvial fan floodplains are unpredictable, making it more difficult to delineate flood hazard areas. In addition to water, flows in alluvial fan floods often contain mud, rocks, and boulders and cause scour. All of these conditions can be devastating in urban areas. Many of the alluvial fan floodplains in Southern California have experienced development and are projected for additional development.

The Task Force was able to develop several recommendations for alluvial fan flooding issues. As one of the following recommendations indicates, additional work is needed to more fully define the issues.

5.1 Recommendation: Priority for alluvial fan floodplain mapping should be given to those alluvial fan floodplains being considered for development.

5.2 Recommendation: Entities involved in land-use planning for alluvial fans, distinct from FEMA mapping, should address the following:

- Alluvial fan flood flows are generally unpredictable, and a site analysis should be performed to determine all reasonably foreseeable flood apex flow paths.
- Flood flow depths and velocities should be determined for these flow paths.
- Any debris and scour associated with reasonably foreseeable apex flood flow should be determined.
- Land-use agencies should be encouraged to ensure that new development will not be damaged by the special risks associated with alluvial floods. These risks include velocities, debris, and scour associated with reasonably foreseeable floods.

5.3 Recommendation: The State should convene a task force specifically for alluvial fans, with stakeholder participation, to review the state of knowledge regarding alluvial fan floodplains, to determine future research needs, and, if appropriate, to develop recommendations specific to alluvial fan floodplain management.

5.4 Recommendation: In making land-use decisions, local governments should have knowledge of the characteristics of alluvial fan floodplains.

5.5 Recommendation: As with other types of floodplains, local agencies should assess the risks of the reasonably foreseeable flood instead of relying solely on the 100-year flood.

5.6 Recommendation: Residents in alluvial fan floodplains should be informed of any increased risks that might result from changed conditions, including fire, seismic activity, or other physical changes, that could affect the risk of alluvial fan flooding.

5.7 Recommendation: Structural and/or non-structural measures should be explored to provide sufficient flow-through areas on alluvial fans.

6. STREAM GAGING AND MONITORING

Problem: Federal and State budget cuts have reduced the number of stream gages in California. This reduction means that historical flow data are not maintained and updated. Therefore, estimates of flow for mapping purposes are less extensive, especially given the potential for climate changes. In addition, real time information needed for flood fighting is less available.

Recommendation: DWR and other agencies should sponsor projects in cooperation with the United States Geological Survey (USGS) to install and maintain additional gages and, where appropriate, include real-time technology in priority locations throughout California.

7. REPETITIVE LOSSES

Problem: Some homes, businesses, and public infrastructure located in floodplains are flooded repeatedly. Repetitive loss causes major economic and social disruptions. Owners may be willing to have their residential structures and businesses floodproofed or relocated; when damages are substantial, NFIP communities must require either floodproofing or relocation. However, local agencies may not be aware of voluntary programs that are offered to their residential property owners, businesses, and public agencies by FEMA to assist in reducing repetitive flood losses. FEMA sponsors these programs through DWR and the Governor's Office of Emergency Services (OES). Other agencies may also have resources to reduce repetitive losses.

Recommendation: Local agencies should work with the OES and/or DWR to identify whether they have any residential properties or businesses that flood repeatedly. If so, they should work with OES and/or DWR and other agencies to make voluntary programs available for residences, businesses, and public infrastructure and to encourage owners to take advantage of these programs to reduce repetitive losses.

8. FLOOD WARNING AND LOCAL COMMUNITY FLOOD RESPONSE PROGRAMS

Problem: Flood warning programs, including real-time flood risk information, are not available for all areas. The absence of reliable flood warning programs can delay evacuation and flood fighting and lead to loss of life and property.

Recommendation: The State should increase assistance to local agencies to improve flood-warning programs. Those programs should promote and develop effective systems specific to each watershed and based on improved instrumentation, communication systems, and advanced remote sensing technology. Flood-prone communities should (1) develop and publish potential evacuation routes for the whole community, specifically including those areas developed with flood protection levees, (2) provide real-time multi-lingual information on flood risk to its population to minimize loss of life and property, (3) conduct periodic flood simulation exercises, and (4) include community input and involvement.

9. FLOOD INSURANCE RATE MAP (FIRM) ISSUES

Problems: Local communities misunderstand the purpose of FIRMs. Although FIRMs do not necessarily represent the full extent of a community's flood-prone area, they are required for participation in the NFIP and often form the exclusive basis of a community's flood management efforts. Many flood-prone areas have not been mapped. Where maps do exist, most are more than a decade old and do not account for future or current build-out.

9.1 Recommendation: Decision makers should use FIRMs conservatively, as a decision tool starting point, if they provide the best information available. However, decision makers should gather information and data beyond FIRMs, including historical flood damage records, to better predict and plan for reasonably foreseeable floods.

9.2 Recommendation: DWR should continue to participate collaboratively with local communities in FEMA's Mapping Needs Update Support System (MNUSS) program, which provides a priority-setting tool.

9.3 Recommendation: The State should affirm its support for FEMA's Map Modernization Program and update existing flood maps, pursuant to MNUSS priorities, as soon as possible.

9.4 Recommendation: Local agencies should request that FIRM maps from FEMA include build-out as well as current development. If new or additional floodwater management measures are implemented in the future, their impacts should be reflected in updated floodplain maps. If new or additional floodwater management projects alter the size of a floodplain, cities and counties should evaluate their objectives for areas removed from or added to that floodplain.

10. EXCEEDING NFIP MINIMUM FLOODPLAIN MANAGEMENT REQUIREMENTS

Problem: Currently, some communities allow the lowest floor of new buildings to be constructed at or above the base flood elevation, as shown on FEMA FIRMs. The mapping technology and methods used to map and define floodplains produce estimates that necessarily involve uncertainty about the precise size and depth of the 100-year floodplain. In addition, anticipated and unanticipated changes in the watershed, including new flow data, can change the level of flooding of the 100-year flood from that shown on issued FIRMs. Also, the impacts of global climate change may increase uncertainties related to the magnitude of both the base flood and reasonably foreseeable floods. Finally, since FEMA allows encroachment in its regulated floodway fringe, the predetermined base flood elevation is permitted to rise. Therefore, a building built to minimum standards in FEMA's floodway fringe could be subject to damage from the 100-year flood as encroachment occurs.

Recommendation: Local communities should be encouraged to require new and substantially improved buildings to have their lowest floor elevations to be at least one foot above the NFIP's base flood elevation, factoring in the effect of full build out of the watershed. The effects of new or additional flood management measures should be reflected in an updated base flood elevation.

11. EXECUTIVE ORDER

Problem: Many State agencies do not adequately consider the use of current floodplain management knowledge and practices in their decision-making processes. The Governor's 1977 Executive Order for Floodplain Management, B-39-77, has not been updated to reflect more current floodplain management knowledge and practices or changes in federal law. As a result, State agencies may contribute to further loss or degradation of floodplain resources and increased flood risks to State facilities.

FEMA has notified the State that its existing Executive Order for floodplain management issued in 1977 does not effectively bring the State and its political subdivisions into compliance with the NFIP. According to FEMA, continued noncompliance could endanger the State's ability to obtain federal financing from FEMA and other federal sources for State building construction and improvement projects located in floodplains and for disaster recovery.

Recommendation: The Governor should update the 1977 Floodplain Management Executive Order to meet or, where appropriate as allowed by existing law, to exceed current minimum floodplain management criteria. See Appendix C for proposed revisions to the Executive Order language.

For State agencies directly under the jurisdiction of the Executive Branch, the proposed Executive Order should include the following, to the extent allowed by State law:

- For State development in the floodplain, compliance with current minimum NFIP regulations, as stated in Title 44 of the Code of Federal Regulations or succeeding regulations, should be explicitly required.
- For State development in the floodplain State agencies should be encouraged to exceed minimum NFIP regulations, where appropriate.
- State agencies developing or assisting with the development of critical infrastructure should avoid approving such development within a floodplain unless it is clearly demonstrated that this siting is necessary to achieve the purposes of the critical infrastructure, and that the infrastructure will be operable and not create a hazard to public safety during a major flood event.
- State agencies should be directed to consider alternatives that avoid or minimize adverse effects and incompatible development in the floodplain, consistent with their legal authority.
- Consistent with its legal authority, if a State agency has determined to, or proposes to, conduct, support, or allow development, as defined by the State's Executive Order, Note 4, to be located in the floodplain and which is not subject to local floodplain management requirements, the State agency should be encouraged to consider alternatives that avoid or minimize adverse effects and incompatible development in the floodplain.
- Each State agency should be directed to prepare a written statement on how it will comply with the updated Executive Order, subject to review by DWR or OES, as appropriate.

State agencies and State constitutional entities not subject to the authority of the Executive Branch should be:

- Encouraged to comply with the new Executive Order and the provisions of the NFIP, consistent with their legal authority;
- Requested to develop their own Floodplain Management Procedures, consistent with the Executive Order; and
- Encouraged to consider alternatives that avoid or minimize adverse effects and incompatible development in the floodplain, consistent with their legal authority.

12. STATE MULTI- HAZARD MITIGATION PLAN

Problem: The Federal Disaster Mitigation Act of 2000 (DMA) requires California to prepare a Multi-Hazard Mitigation Plan by 2004 to continue to be eligible for federal disaster assistance funding.

Recommendation: DWR should partner with OES and other agencies to incorporate into the State Multi-Hazard Mitigation Plan floodplain management measures that will, at a minimum, meet FEMA's requirements.

13. MULTI-HAZARD MAPPING

Problem: The State does not have a specific permanent program for multiple-hazard (e.g., flood, fire, seismic, etc.) mapping. Therefore, decision makers and the public may not be fully aware of all of the threats to life and property from multiple hazards or of hazard mitigation needs in California.

Recommendation: OES should coordinate with other hazard mapping efforts and create a permanent program with the specific purpose of developing and distributing GIS-based multi-hazard advisory maps for use by local governments and the public.

14. STATE BUILDING CODES

Problem: Local community building departments authorized to issue building permits are governed by the California Building Standards law and other statutes, which regulate what code requirements apply to what types of buildings. The California Building Standards Code consists of several parts, some of which may apply statewide and some of which may apply to certain types of uses. In addition, local governments may adopt codes if State requirements do not apply and may modify certain State codes for limited reasons. NFIP requirements are not always adequately considered in the enactment and implementation of the codes.

Recommendation: Ensure that the California Building Standards Code meets, at a minimum, NFIP requirements. Ensure that other State codes applicable to public buildings meet, at a minimum, NFIP requirements. Ensure that any local code adoptions or amendments and any development approvals meet, at a minimum, NFIP requirements.

Recommendations for Multi-Objective-Management Approach for Floodplains

In the past, many projects within floodplains were developed and implemented to carry out single-purpose objectives, without considering the importance of flooding in maintaining a healthy environment. Conversely, some ecosystem restoration projects have been implemented without sufficient consideration of long-term floodway maintenance requirements. In addition to achieving single purpose objectives rather than multiple objectives, these approaches may have adversely impacted other beneficial uses of the floodplains.

Floodplain ecosystems provide essential habitat for multiple species of plants and wildlife. About 55 percent of the animals and 25 percent of the plants designated by the State as threatened or endangered depend on

wetland habitats. In the U.S., California ranks second in the number of endangered aquatic species (Pacific Marine Fisheries Council, 2000). California is the winter home of more than 60 percent of the migratory waterfowl in the Pacific Flyway. Over the years, approximately 95 percent of this wetland and riparian habitat, which serves wintering ducks, geese, swans, and millions of other birds that use the Pacific Flyway, has been lost (Wildlife Conservation Board, 2002).

In addition to the importance of floodplain habitats for native plants and wildlife, the associated freshwater ecosystems are essential for providing goods and services valued by society. These goods and services include soil replenishment, water quality, timber production, fishing, and cultural, recreational, and scenic benefits.

Agriculture provides a safe, healthy, reliable food supply, valuable wildlife habitat and open space, groundwater replenishment, cultural, recreational, and scenic benefits. All of which serve the objectives of the multi-objective management approach for floodplains. California has been the largest agriculture producing state in the U.S. since 1948; current gross production is $27 billion. Much of California's richest farmland is found in its floodplains. For example, according to the California Farm Bureau Federation, approximately 60 percent of farmland in the San Joaquin Valley is in the floodplains.

At the same time, California is challenged with ways to accommodate a rapidly increasing population. The State Department of Finance estimates that California's population will grow by at least 14 million in the next 25 years. All of these people will need homes, jobs, services, public facilities, and other types of development.

While single-purpose flood management projects were common in the past, they no longer are considered the preferable approach to floodplain management. Increasingly, floodplains are seen as valuable resources for our society. In addition, greater incentives are being provided for multi-objective-management (M-O-M) projects. AB 1147 of 2000 (Proposition 13) provided significant financial incentives for multi-purpose flood protection projects that also address ecosystem and recreational needs. The Safe Drinking Water, Watershed Protection, and Flood Protection Act of 2000 contains grant-funding for projects that combine flood protection with agricultural conservation and ecosystem restoration. The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Proposition 50) contains additional incentives for watershed-based management approaches.

More local agencies are beginning to pursue multiple objective floodwater management programs. The Sacramento Area Flood Control Agency and the Santa Clara Valley Water District have found that including ecosystem restoration and recreation elements results in broader support for flood management projects.

Stakeholders in the Santa Ana River watershed in San Bernardino, Riverside, and Orange Counties are achieving agricultural, groundwater recharge, ecosystem, and flood protection benefits with their M-O-M programs. Stakeholders along the Tuolumne River, a tributary to the San Joaquin River, are receiving grant funding for projects that combine flood protection with ecosystem restoration. In the Cosumnes River watershed, healthy agriculture is a major part of flood protection and ecosystem restoration. Similar successes are found throughout California.

SUMMARY OF RECOMMENDATIONS

Local, State, and federal agencies should implement multi-objective management for floodplains on a watershed basis. Where feasible, projects should provide adequate protection for natural, recreational, residential, business, economic, agricultural, and cultural resources and protect water quality and supply.

Recommendations

15. MULTI-OBJECTIVE MANAGEMENT

Problem: Many flood management programs and projects do not follow a M-O-M approach. Traditionally, programs and projects have emphasized flood damage reduction, with little or no consideration of the potential benefits of floodplains.

Recommendation: Promote a M-O-M approach to flood management projects. State and local agencies should approach flood management as part of multi-objective watershed management. Where feasible, these projects should provide adequate protection for natural, recreational, residential, business, economic, agricultural, and cultural resources and protect water quality and supply.

16. FLOOD MANAGEMENT APPROACHES FOR ECOSYSTEM RESTORATION AND AGRICULTURAL CONSERVATION

Problem: Historically, flood management projects generally have not given adequate consideration to the restoration and protection of natural floodplains or the conservation of agriculture. Creative approaches that provide for these objectives exist and need to be used, where feasible, when designing or improving flood management projects.

Recommendation: While providing for public safety and flood damage reduction, flood management programs and projects should maximize opportunities for agricultural conservation and ecosystem protection and restoration, where feasible. When land is being considered for use in a flood management project or program, the following should be addressed equitably:

- Conserve productive agricultural land and natural habitat;
- Promote the recovery and stability of agriculture;
- Promote the recovery and stability of native species populations, and overall biotic community diversity;
- Provide for natural, dynamic hydrologic, and geomorphic processes;
- Increase and improve the quantity, diversity, and connectivity of native habitat;
- Eliminate or mitigate negative redirected impacts to neighboring landowners; and
- Evaluate and address economic impacts to local communities and regions.

17. NONSTRUCTURAL APPROACHES, RESTORATION, AND CONSERVATION OF AGRICULTURE AND NATURAL LANDS

Problem: Traditional structural approaches to floodwater management have provided significant protection from flooding. However, there can be disadvantages to using structural approaches, including:

- Increased risk of catastrophic flooding if structures fail or exceed capacity;
- Damage to natural resources and natural floodplain function; and
- Increased economic damages if catastrophic flooding occurs.

Nonstructural approaches to floodwater and floodplain management, such as the conservation of agriculture and natural lands in floodplains, can complement or substitute for structural approaches, where appropriate.

Recommendation: In planning new or upgraded floodwater management programs and projects, including structural projects, local and State agencies should, where appropriate, encourage nonstructural approaches and the conservation of the beneficial uses and functions of floodplains. It is recognized that some structural approaches provide needed flood protection and opportunities for agricultural conservation and ecosystem protection and restoration.

18. TOOLS FOR PROTECTION OF FLOOD-COMPATIBLE LAND USES

Problem: Protection and promotion of flood-compatible land uses, such as agriculture, recreation, and native habitat, require a variety of incentive-based tools for private landowners and local governments. Different areas require various degrees and types of protection, and landowners have different needs and preferences for their property; the current array of tools fail to accommodate these differences. Support for these tools is necessary at the State level.

Recommendation: The State should identify, develop, and support a variety of tools for the protection of flood-compatible land uses. These tools should be developed in consultation with, and be made available to,

private landowners, local governments, and non-governmental organizations. Examples of such tools can include:

- Easement/fee acquisition programs
- Management payments
- Land exchanges/bank
- Incentives for placing new development outside of the floodplain
- Safe harbor policy
- Adjacent landowner protections
- Stewardship incentive payments
- Voluntary agriculture wildlife habitats
- Habitat conservation plans
- Natural community conservation programs
- Special area management plans

19. PROTECTION OF FLOODPLAIN GROUNDWATER RECHARGE AREAS

Problem: Most floodplains, including alluvial fans, provide valuable groundwater recharge. Paving over such recharge areas reduces the groundwater recharge capacity, thus potentially affecting some surface flows and the groundwater supply. Some permitting agencies are making land-use decisions without full knowledge of the impacts on natural groundwater recharge.

Recommendation: Permitting agencies should consider the impacts of land-use decisions on the capacity of the floodplain to recharge groundwater.

20. VECTOR CONTROL

Problem: Ecosystem restoration projects within the floodplain have the potential to raise public health issues, particularly in regard to mosquito-transmitted diseases. In response to this potential risk, local communities may identify a need to increase their vector control efforts, which can impose a financial burden.

Recommendation: Planning and development of ecosystem restoration projects should consider costs and impacts with respect to vector control and monitoring related to mosquito-transmitted diseases.

21. MULTI-JURISDICTIONAL PARTNERSHIPS

Problem: Flood management projects often are approached on a jurisdictional basis, without consideration of the impacts to other communities in the watershed.

Recommendation: The State should encourage multi-jurisdictional partnerships when floodplain management projects are planned and implemented. Jurisdiction-based projects provide localized solutions, when a greater benefit might be achieved if the project adopted a watershed-wide approach. Communities and jurisdictions should work together to develop, implement, and monitor watershed-wide floodplain management programs.

22. WATERSHED MONITORING

Problem: Historically, floodwater management projects have been planned at a local level to solve localized problems; thus, projects do not always address regional problems. After projects are completed, the performance of each project is monitored only at the local level, at best; monitoring on a comprehensive basis is not done.

Recommendation: The State and others should financially support comprehensive monitoring of flood management projects, including impacts on natural resources and other intended multiple objectives, on a watershed level or other appropriate scale.

23. PROACTIVE AND ADAPTIVE MANAGEMENT OF FLOODPLAINS

Problem: All benefits of a floodplain are not realized if changing economic, hydraulic, environmental, and biological conditions are overlooked.

Recommendation: State and local agencies should manage floodplains proactively and adaptively by periodically adjusting to current environmental, economic, hydraulic, and biological conditions and in response to new scientific information and knowledge. If new or additional flood management projects alter the size of a floodplain, cities and counties should evaluate all of their objectives for the area removed from or added to that floodplain.

24. BEST MANAGEMENT PRACTICES

Problem: Although many agencies and organizations are carrying out effective floodplain management practices, mechanisms for identifying and disseminating best management practices (BMPs) to others are limited. That means that individual agencies and organizations are frequently left to "reinvent the wheel" rather than being able to benefit from the knowledge and experience of others. Examples of successful State

and local jurisdiction floodplain management policies and programs are not commonly shared. These success stories are not readily available or used to the maximum extent possible for public benefits.

24.1 Recommendation: DWR should work with stakeholders to develop a process for identifying, monitoring, and updating voluntary BMPs for multi-objective floodplain management. This could be similar to the successful California Urban Water Conservation Council model that has been used for over a decade to identify BMPs for urban water conservation. Over 200 organizations voluntarily come together in the Council to share what they have learned.

24.2 Recommendation: Encourage floodplain proponents and professionals, such as the Floodplain Management Association, the National Association of Flood and Stormwater Management Agencies, and the Association of State Floodplain Managers, to identify and share successful State and local programs and policies.

24.3 Recommendation: DWR should review State and local floodplain management policies, projects, and programs, identify successes that have been achieved, and share those examples with other State and local entities and floodplain managers.

25. MULTI-OBJECTIVE FLOODPLAIN MANAGEMENT TRAINING, EDUCATION, AND PROFESSIONAL CERTIFICATION

Problem: Floodplain management calls for multi-disciplinary knowledge including hydrology, flood hazard reduction, ecosystem restoration, and other topics. Generally, colleges and universities do not offer floodplain management courses as part of their curricula. There are few certified State floodplain management professionals in California.

25.1 Recommendation: The State should encourage the inclusion of multi-objective floodplain management curricula in urban planning, civil engineering, hydrology, and other degree programs at colleges and universities.

25.2 Recommendation: The State should encourage the training, education, and professional certification of floodplain management professionals to provide local decision makers with the best professional support.

25.3 Recommendation: DWR, in coordination with the Association of State Floodplain Managers, the Floodplain Management Association, and other professional organizations, should provide training,

education, and certifications of floodplain management professionals to ensure they have the multi-objective floodplain knowledge and tools necessary to perform their jobs efficiently and effectively.

25.4 Recommendation: The State should develop custom-designed short courses and offer them to local officials and leaders, such as the Board of Supervisors, planning commissioners, and other decision makers, to increase floodplain management awareness of issues and techniques.

25.5 Recommendation: The State should offer programs that include training specific to all types of floodplains, (alluvial, riverine, and coastal) and recognize the expertise of existing practitioners through certification.

26. COORDINATION AMONG AGENCIES AND GROUPS

Problem: Inadequate coordination among local, State, and federal agencies and non-governmental organizations regarding flood management policies, programs, and practices often limits the effectiveness of comprehensive flood management.

Recommendation: The State should encourage and create incentives for additional coordination among all stakeholders. Roles, responsibilities, and conflicts of local, State, federal, and non-governmental agencies should be identified and addressed.

27. STATE GENERAL PLAN GUIDELINES

Problem: The State's *General Plan Guidelines* are used by local land-use jurisdictions to update the State-required local *General Plan*. The Governor's Office of Planning and Research (OPR) is currently updating the 1998 *General Plan Guidelines* for completion in 2003 and is requesting comments by December 16, 2002. The Task Force should comment on the 2002 draft guidelines to assure incorporation of the latest issues on flood management.

Recommendation: DWR should provide the Task Force's recommended changes to the 2002 draft *Guidelines* for consideration by OPR during the public review period. The Task Force should support the incorporation of flood management in the State's 2002 draft *General Plan Guidelines* as indicated in Appendix B of this report. The recommended changes proposed in Appendix B address the following concepts:

- Integrate flood management advice into the Flood Management Section of the Safety Element;
- Link flood management advice with other *General Plan* elements;
- Expand the discussion of floodplain functions;
- Address flood management on a watershed basis with system-wide approaches;

- Update information regarding data sources;
- Update the discussion of the federal flood insurance program and its regulations;
- Incorporate a discussion of the requirements of the federal Disaster Mitigation Act of 2000, including requirements for a Multi-Hazard Mitigation Plan for future disaster relief funds;
- Expand the discussion of flood management to encourage multi-objective management and consideration of various local environmental, social, and fiscal issues;
- Expand the Safety Element Relevant Issues Section to include reasonably foreseeable flood areas, repetitive losses, and flood management mitigation measures;
- Expand the Safety Element's Ideas for Development Policies to include multi-jurisdictional planning for flood management and multi-hazard mitigation measures, including references to FEMA regulations pursuant to the federal Disaster Mitigation Act of 2000;
- Expand the Safety Element's Ideas for Implementation by including multi-hazard mitigation planning approaches and provide a discussion of alluvial fan flood management issues, if applicable; and
- Expand NFIP map discussion to indicate disadvantages of depending solely on FEMA Flood Insurance Rate Maps. Also provide appropriate references to FEMA and Task Force definitions for various issues related to flood management.

Recommendations for Local Assistance, Funding, and Legislation

Additional local technical assistance, funding, and legislation will be required for many of the suggested floodplain management recommendations by the Task Force to be implemented. Lack of adequate funding and some existing State policies have been major obstacles to the implementation of comprehensive statewide floodplain management. For example, FEMA funding has been virtually stagnant for the Community Assistance Program since 1990, and State baseline funding requests for technical assistance and education have been denied. Without funding, the recommendations provided in this report with the purpose of coordinating and improving current floodplain management practices in the State of California cannot be implemented.

Task Force members explored funding options to maximize existing funds and identify possible sources for new funding from local, State, and federal governments and nongovernmental sources. Technical assistance, funding, and education were recognized as critical components for local government implementation of any new or existing programs. Incentive-based programs were identified as a good means of increasing public and private participation in floodplain management projects. In addition, specific legislation was identified to ensure the full participation and cooperation of the State government.

SUMMARY OF THE RECOMMENDATIONS

DWR should identify and actively pursue funding opportunities, technical assistance to local governments and other organizations, and legislative proposals to implement Task Force recommendations and ensure successful floodplain management, recognizing that local governments have the primary responsibility and authority for land-use decisions.

Recommendations

28. NEW AND EXISTING FUNDING SOURCES

Problem: Currently, local, State, and federal funding for floodplain management is fragmented, inadequate, and unreliable. Without new or increased funding, programs and policies recommended by the Task Force could be delayed or not implemented.

28.1 Recommendation: State and local governments should increase and leverage federal programs, as appropriate, and encourage local, State, federal, public, nongovernmental, and other private cost sharing to achieve equitable and fair financing of multi-objective floodplain management actions and planning.

28.2 Recommendation: The State should identify potential sources of funding to support the implementation of Task Force recommendations. These sources should include water bonds, assessment fees, federal grants, or State General Fund appropriations.

28.3 Recommendation: The State should identify and disseminate information on existing funding sources, including funding reliability, variability, and authority to provide the support needed to implement Task Force recommendations. To accomplish this, the State should create and maintain a database of funding sources for local, State, and federal floodplain management-related activities and planning.

29. TASK FORCE RECOMMENDATION PRIORITIES

Problem: The State is limited in its ability to fund all of the Task Force recommendations, and it will require a method for prioritizing and ranking those recommendations, that have cost, based upon appropriate floodplain management criteria.

Recommendation: DWR and The Reclamation Board should take the cooperative lead in developing a consensus process, involving appropriate stakeholders, in identifying criteria for and carry out prioritization of Task Force recommendations, based on expected expenditures, from existing and new funding sources.

30. DEPARTMENT OF WATER RESOURCES OUTREACH PROGRAMS

Problem: Many Californians living in flood-prone regions are unaware of flooding hazards and available mitigation measures. Therefore, existing public information and outreach are inadequate for public safety.

Recommendation: Expand and implement DWR's outreach programs by implementing the following actions.

- Provide public service announcements to increase public awareness of all of the values of floodplains, and of flooding hazards, public safety, and hazard mitigation measures. Provide information and supporting material.
- Use all media and electronic communication, including print, local television programs, public and commercial radio, and the Internet.
- Create an interactive Web site for public access to information about flooding.
- Produce multi-lingual and cross-generational educational materials.
- Coordinate public safety awareness efforts with State and federal agencies including OES.
- Support local flood management agency and county requests for technical assistance. DWR should offer to provide technical assistance to local communities, including in areas where new development is likely to occur.

31. DESIGNATED FLOODWAYS

Problem: The State's Designated Floodway Program, which is limited to the Central Valley, is not comprehensive statewide. As a result, non-flood-compatible development is occurring and may continue to occur within floodways. Non-flood-compatible development in these areas may put people and structures at risk and may impact the operation of the floodwater management systems.

Some interests believe that The Reclamation Board regulations can be impediments to flood compatible uses, such as agriculture and habitat, within floodways.

Recommendation:

31.1 Include in the Community Assistance Workshops, held in the Central Valley and provided by DWR and The Reclamation Board staff, an educational component on The Reclamation Board's current authority to adopt and update designated floodways in the Central Valley. The workshops should include the current status of existing designated floodways, and a comparison of the Reclamation Board's Designated Floodways Program to FEMA's NFIP. For areas within its jurisdiction, the Reclamation Board should meet with stakeholders to communicate existing policies and procedures for designating floodways and approving

encroachments within the floodway. For areas outside the Reclamation Board's jurisdiction, DWR should expand its technical assistance to local agencies for their use as they designate floodways for their own or FEMA purposes.

31.2 The Reclamation Board should work with stakeholders to identify, if any, a list of Reclamation Board regulations that are impediments to flood-compatible uses within the floodway and recommend specific revisions.

32. STATE FLOODPLAIN MANAGEMENT ASSISTANCE TO LOCAL GOVERNMENTS

Problem: Technical assistance requests by local governments to the State for floodplain management assistance have increased because of greater awareness of flood hazards. Currently, the State's cost-sharing participation in FEMA's Community Assistance Program is limited by insufficient State funding. In addition, FEMA has eliminated the Community Assistance Contact portion of the Community Assistance Program in Region IX, which includes California. This has decreased coordination and communication with local communities.

Recommendation: The State should provide additional resources to continue and enhance the implementation of the State's floodplain management programs, including full support of the Community Assistance Contact program.

33. COMPLIANCE WITH NATIONAL FLOOD INSURANCE PROGRAM REQUIREMENTS

Problem: Some new and existing public facilities, such as schools, are and continue to be placed at risk from known flood hazards. Various public agencies in California either are not aware of, or believe they are not required to comply with, NFIP standards, local floodplain management ordinances, or the Governor's Executive Order on Floodplain Management. For example, in 2001 FEMA formally notified the State that some public schools are out of compliance with the NFIP, and that those school districts, governed by local school boards, believe that they are not subject to the requirements of local floodplain management ordinances under State law. FEMA requires that communities that participate in the NFIP and experience the benefits of the program adopt legally enforceable floodplain management standards. It is FEMA's view that unless public schools comply with NFIP requirements, States or participating NFIP communities may lose program eligibility. This means that State or local governments that do not adopt floodplain management regulations consistent with at least the minimum standards of the NFIP, cannot participate in the NFIP or be eligible for federal financial assistance for buildings in the special flood hazard areas of their community.

In some cases, State agencies with discretionary permitting authority over floodplain development are not required to consider the project's compliance with NFIP. This circumstance may result in the State inadvertently superceding local floodplain management ordinances. Failure to enforce NFIP minimums could result in the loss of NFIP eligibility (including accompanying federal assistance for buildings in special flood hazard areas) for local California communities or perhaps the entire state of California. In these cases, the State misses the opportunity to demonstrate its desire to show leadership in ensuring that good floodplain management be accomplished statewide where the State plays a key decision-making role.

33.1 Recommendation: To assure compliance with NFIP requirements, legislation should be enacted, or other mechanisms implemented for public agencies not subject to local government floodplain management requirements or the provisions in the current or proposed Governor's Executive Order on Floodplain Management. This compliance is a requisite for participation in NFIP and to receive associated program benefits. This action includes public agencies in addition to the State, school districts, special districts, post-secondary education providers, housing authorities, and others.

In the interim, the State should identify the public agencies not covered by the current or proposed Executive Order and inform them of the benefits of participation in, and compliance with, NFIP requirements and/or the current or proposed Executive Order standards and the consequences of noncompliance with NFIP requirements and/or the current or proposed Executive Order standards.

33.2 Recommendation: DWR and OES should fully explore the problem and develop any necessary legislation to require appropriate State agencies with discretionary permitting authority over floodplain developments to take actions, such as the following, prior to issuing a permit:

- Assure the project's compliance with NFIP;
- Address other flood hazards; and
- Address adverse impacts to natural floodplain functions.

34. COMMUNITY RATING SYSTEM

Problem: NFIP flood insurance policy holders and communities may not be receiving the lowest available insurance rates or may not have access to other federal assistance programs because their community is not a Community Rating System (CRS) participating community. NFIP communities may not be participating because of the lack of understanding and training necessary to fully participate in and benefit from the CRS insurance rate-adjusting program for local communities.

Recommendation: DWR should encourage training in the CRS to educate local officials and the interested public about the elements and benefits of the program.

35. STATE COMMUNITY RATING SYSTEM PROGRAM COORDINATOR

Problem: In California, less than 10 percent of all NFIP communities (about 50) participate in the CRS, which is designed to encourage community floodplain management activities to exceed NFIP requirements. Without a designated State-level CRS Coordinator, many communities do not have the tools to take advantage of this program and receive the financial incentives available to reduce the potential loss of life and property from reasonably foreseeable flooding.

Recommendation: DWR should designate a CRS Coordinator at the State level who is familiar with the operation of State agencies and local governments that perform activities related to the CRS program. The CRS Coordinator should:

- Serve as a point of contact for FEMA and the Insurance Services Office (ISO);
- Provide support for cities and counties;
- Examine ways in which the State can apply for CRS activities on behalf of its communities;
- Encourage employees at the State and local levels to attend seminars to improve their knowledge of the CRS program and its benefits; and
- Examine ways to encourage increased participation in the CRS program by NFIP communities in California by State agencies not subject to the Governor's authority and by local government entities other than cities and counties.

36. INTERAGENCY BARRIERS

Problem Statement: There are some interagency barriers between State and federal agencies, such as those involving The Reclamation Board and the Corps of Engineers, in implementing multi-objective flood management projects.

Recommendation: The Reclamation Board should work with the Corps of Engineers, State agencies, local sponsors and interested parties to identify interagency barriers to efficient implementation of multi-objective flood management projects and to develop options to overcome those interagency barriers.

37. CALIFORNIA ENVIRONMENTAL QUALITY ACT LOCAL ANAYLSIS IMPROVEMENT

Problem: The California Environmental Quality Act **(**CEQA) Guidelines, Appendix G, provides a checklist for addressing flooding impacts under the Hydrology and Water Quality Section. The checklist should be

improved to ensure that projects are evaluated for flooding impacts. In addition, some CEQA practitioners and local governments do not utilize the CEQA checklist adequately when evaluating flood impacts.

37.1 Recommendation: DWR should provide technical assistance to local agencies and practitioners with a practical step-by-step CEQA flood hazard and impacts assessment guide. DWR should develop definition and methodology for local jurisdiction determination of "reasonably foreseeable flood."

37.2 Recommendation: The Resources Agency should update Appendix G of the CEQA Guidelines to include the changes indicated in Appendix D of this report.

38. ESTABLISHMENT OF A CALIFORNIA FLOODPLAIN MANAGEMENT ADVISORY COMMITTEE

Problem: The Task Force recommendations identify opportunities for effective floodplain management. During Task Force discussions, many issues emerged that require additional stakeholder discussion for improving floodplain management practices.

Recommendation: DWR should sponsor an ongoing floodplain management advisory committee composed of local and State governments, floodplain managers, and other stakeholders to develop additional recommendations to improve floodplain management practices.

APPENDICES

A. Glossary

B. Proposed Comments on the California State General Plan Guidelines

C. Proposed California Floodplain Management Executive Order Revision

D. Proposed changes to the California Environmental Quality Act Appendix G – Hydraulics and Water Quality Section

E. Staff and Consultants

F. Bibliography

APPENDIX A - Glossary

Adjacent landowner protections – An overarching term that applies to permits, regulations, and voluntary programs that preclude actions of one landowner from inducing flooding to a neighboring landowner.

Agriculture wildlife habitat – Practices to promote working landscapes that are profitable for agriculture and beneficial for wildlife.

Agua Caliente tribe – The Agua Caliente Band of Cahuilla Indians is a federally recognized Indian tribe. It is a sovereign tribal government that maintains government-to-government relations with other governments, such as the government of the State of California.

Alluvial fan – A gently sloping, fan-shaped landform created over time by deposition of eroded sediment. They are common at the base of mountain ranges in arid and semiarid regions, such as the American West (Taken from National Academy Press, Alluvial Fan Flooding, 1996).

Alluvial fan flooding – Flooding occurring on the surface of an alluvial fan or similar landform, which originates at the apex and is characterized by high-velocity flows, active processes of erosion, sediment transport, deposition, and unpredictable flow paths.

Assembly Bill No. 1147 – Governor Davis signed AB 1147 in 2000. This bill authorizes twelve flood control projects, modifies the State local cost-sharing formula for participation in federal flood protection projects, significantly increases the State's oversight on federal flood control projects and recommends establishment of a Floodplain Management Task Force.

Association of California Water Agencies (ACWA) – ACWA is a statewide association whose more than 435 public water agency members are responsible for 90 percent of the water delivered in California.

Association of State Floodplain Managers – The Association of State Floodplain Managers (ASFPM) is an organization of professionals, including members of all levels of government, scientists, engineers, and members of the insurance industry, involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning and recovery. By fostering communication, providing technical advice and encouraging research, education, and training, the Association of State Floodplain Managers mission is to reduce loss of human life and property damage resulting from flooding, preserve the natural and cultural values of floodplains, and avoid actions that exacerbate flooding.

Awareness Floodplain Mapping Program - DWR's Awareness Floodplain Mapping Program uses approximate hydrologic and hydraulic modeling methods. Typically, this program provides communities' maps showing previously unmapped flood hazard areas more quickly and economically than NFIP Flood Insurance Rate Maps.

Base Flood Elevation (BFE) – The base flood elevation is the height of the base flood, usually in feet, in relation to the National Geodetic Vertical Datum of 1929, the North American Vertical Datum of 1988, or other datum referenced in the Flood National Research Council. The base flood is defined as a flood event that has a one percent or greater chance of occurrence in any given year.

California Association of REALTORS® – The California Association of Realtors is a statewide trade association of more than 110,000 members dedicated to the advancement of professionalism in real estate. The Association develops and promotes programs and services that will enhance the members' freedom and

ability to conduct their individual businesses successfully with integrity and competency and, through collective action, promotes the preservation of real property rights.

California Association of Resource Conservation Districts – A statewide organization serving 103 Resource Conservation Districts (RCD) covering 85 percent of California's land. The Association develops and promotes progress and services of local RCDs who provide services to local landowners and uses who implement conservation measures using the voluntary approach to resource management.

California Building Industry Association – The California Building Industry Association (CBIA) is a statewide trade association representing nearly 6,000 businesses – homebuilders, remodelers, subcontractors, architects, engineers, designers, and other industry professionals before the State Legislature and regulatory agencies. By advocating legislative and administrative reforms needed to ensure that there is quality, affordable housing for all Californians, CBIA is working to remove barriers to housing construction that have resulted in a significant housing shortfall throughout California.

California Business Properties Association – The California Business Properties Association (CBPA) serves property owners, tenants, developers, retailers, contractors, lawyers, brokers, and other professionals in the industry by representing their interests at the State Capitol and in Washington, D.C., as well as responding to regulatory actions of dozens of state and federal agencies. CBPA is the designated legislative advocate for the International Council of Shopping Centers, the California chapters of the National Association of Industrial and Office Properties, the International Mass Retail Association, the Associated Builders & Contractors of California, the Institute of Real Estate Management, and Commercial Real Estate Women.

California Central Valley Flood Control Association – The California Central Valley Flood Control Association represents reclamation and levee districts, cities, and counties within the Central Valley and Sacramento/San Joaquin River Delta of California in promoting their common interest of constructing and maintaining effective flood control systems for protection of life, property, and environmental values. The Association's purposes include, the promotion of positive public and governmental attitudes toward the flood control activities of its member agencies, to promote the distribution and interchange of ideas and information among member agencies and the public, and to advocate on behalf of flood control interests before the State and federal legislatures, state and federal agencies, and others to promote effective flood control systems.

California Department of Food and Agriculture – The California Department of Food and Agriculture (CDFA) protects and promotes California agriculture and consumers through programs and outreach activities including animal health and food safety; services; plant health and pest prevention services; inspection services; measurement standards; fairs and expositions; marketing services; and agricultural export enhancement. An example of specific activities includes providing information on disaster preparedness for animal owners through the CA Animal Response Emergency System (CARES) Plan.

California Department of Water Resources – The California Department of Water Resources is a State agency with the responsibility to manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments. Specific responsibilities of the California Department of Water Resources are to prepare and update the California Water Plan; plan, design, construct, operate, and maintain the State Water Resources Development System; protect and restore the Sacramento-San Joaquin Delta; regulate dams, provide flood protection, and assist in emergency management; educate the public about the importance of water and its proper use; and serve local water needs.

California Farm Bureau Federation – The California Farm Bureau Federation is a farm organization with more than 95,000 member families in 53 county Farm Bureaus. It is a voluntary, nongovernmental, nonpartisan organization of farm and ranch families seeking solutions to the problems that affect their lives, both socially and economically.

California State Association of Counties – The primary purpose of California State Association of Counties (CSAC) is to represent county government before the California Legislature, administrative agencies, and the federal government. CSAC places a strong emphasis on educating the public about the value and need for county programs and services.

California State University Center for Collaborative Policy – The California State University Center for Collaborative Policy (formerly known as the California Center for Public Dispute Resolution) is a joint program of California State University, Sacramento, McGeorge School of Law, and University of the Pacific. The Center offers services to parties seeking collaborative solutions for public decisions and disputes at the federal, state, regional, and local levels. The Center offers its clients services such as mediation, facilitation, conflict assessment, training in consensus building, and dispute resolution systems design.

Coastal Floodplain – A coastal floodplain is any coastal land area susceptible to high velocity wave action from storms or seismic sources or to being inundated by floodwaters from another source.

Committee on Restoration of Aquatic Ecosystems – The Committee on Restoration of Aquatic Ecosystems was appointed by the National Research Council in 1989 to conduct an evaluation of both successful and failed attempts to restore aquatic environments. The committee published their findings in "Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy" in 1992, which outlines a national strategy for aquatic restoration, with recommendations, and case studies of aquatic restoration activities throughout the nation.

Critical infrastructure - Public facilities that are critical to the health and welfare of a population and to disaster response to a hazard event. Critical infrastructure should be presumed to include facilities that, if rendered unserviceable, would impose significant hardship on the public, or that if flooded would pose a threat to public health and public safety. Critical Infrastructure includes but is not limited to emergency response facilities (such as OES, fire and police), hospitals, water purification facilities, sewer treatment facilities, and could include transportation, energy, communication, and power facilities.

Department of Food and Agriculture – California Department of Food and Agriculture protects California agriculture through public outreach programs and communication and programs and services such as the Agricultural Export Program, animal health and food safety services, fairs and expositions, inspection services, marketing services, measurement standards, and plant health and pest prevention services. They also produce guides on disaster preparedness for animal owners through the California Animal Response Emergency System (CARES) Plan.

Department of Housing and Community Development – The Department of Housing and Community Development is California's principal housing agency. The mission of the Department of Housing and Community Development is to provide leadership, policies and programs to expand and preserve safe and affordable housing opportunities and promote strong communities for all Californians. It accomplishes its mission by advocating and supporting housing development; developing, administering and enforcing building codes, manufactured housing standards and mobile home park regulations; and administering State and federal housing, and community development.

Development - Development is any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures.

Ecosystem – Ecosystem is a geographic area including all the living organisms, their physical surroundings, and the natural cycles to sustain them.

Executive Order B-39-77 –Executive Order B-39-77, California's Floodplain Management Executive Order, was signed in November 1977 and does not reflect changes in federal law and FEMA regulations, policy, and

terminology, which have taken place in the 25-year time interval. The Governor's Executive Order on floodplain management is necessary to meet the NFIP regulations which requires state agencies that have programs which may impinge on the floodplain to comply with the same federal regulations as is required by local communities.

Federal Emergency Management Agency (FEMA) – The Federal Emergency Management Agency is an independent agency reporting to the President that is tasked with responding to, planning for, recovering from, and mitigating against disaster. FEMA advises on building codes and floodplain management, teaches people how to get through a disaster, helps equip local and state agencies for emergency preparedness, coordinates the federal response to a disaster, makes disaster assistance available to states, communities, businesses and individuals, trains emergency managers, supports the nation's fire service, and administers the national flood and crime insurance programs.

Federal Interagency Floodplain Management Task Force – The Federal Interagency Floodplain Management Task Force was established in 1975 to carry out the responsibility of the President to prepare for Congress a Unified National Program for Floodplain Management. Member agencies include the Department of Agriculture, Department of Army, Environmental Protection Agency, Federal Emergency, Management Agency, Department of Interior, and the Tennessee Valley Authority.

Flood – A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland and/or tidal waters, and/or the unusual and rapid accumulation or runoff of surface waters from any source, or flooding from any other source.

Flood-compatible - Flood-compatible uses allows the continuation of hydrological and biological processes. Areas such as parks and recreational areas are far less likely to suffer permanent or expensive damage in floods than expensive buildings, businesses, or developments. Use of these areas is more easily avoided during a flood.

- Parks
- Recreation
- Open Spaces
- Agriculture
- Wildlife Habitat
- Parking Lots

Flood Insurance Rate Map (FIRM) – The official Federal Emergency Management Agency (FEMA) map of a community on which the Flood Insurance and Mitigation Administrator (FIMA) has delineated both the special hazard areas and the risk premium zones applicable to the community.

Flood Management - Flood management is the overarching term that encompasses both floodwater management and floodplain management.

Floodplain – A floodplain is any land area susceptible to being inundated by waters from any source, and often bears geophysical evidence of previous flood events. The term is sometimes loosely used as an equivalent to the regulated floodplain.

Floodplain Management - Floodplain management includes actions to the floodplain to reduce losses to human resources within the floodplain and/or protect benefits to natural resources associated with floodplains and flooding. For example:

- Minimizing impacts of flows (e.g. flood-proofing, insurance)

- Maintaining or restoring natural floodplain processes (e.g. natural community succession, meander corridors)
- Removing obstacles within the floodplain voluntarily or with just compensation (e.g. relocating at- risk structures)
- Keeping obstacles out of the floodplain (e.g. planning, mapping, and zoning land use decisions)
- Educating and emergency preparedness planning (e.g. emergency response plans, data collection, outreach, insurance requirements)
- Ensuring that operations of floodwater management systems are not compromised by activities that interfere with, or are damaged by, design floods of these systems.

Floodplain Management measures interrelate and frequently overlap with floodwater management measures to reduce losses within the floodplain. For example:

- Emergency response activities
- Realigning levees
- Reconnecting historical floodplains
- Reoperation of reservoirs

Floodplain Management Association – The Floodplain Management Association is a nonprofit educational association. It was established in 1990 to promote the reduction of flood losses and to encourage the protection and enhancement of natural floodplain values. Members include representatives of federal, state and local government agencies as well as private firms.

Floodplain Mapping – Floodplain mapping programs identify and map areas that are susceptible to flooding. A typical NFIP floodplain map delineates the area that can be expected to flood, at a one percent annual risk, but floodplain maps can be used to delineate any probable flooding event. Floodplain maps generally show the location of the normal channel of a watercourse, surrounding features or developments, ground elevation contours, flood levels and floodplain limits.

Floodproofing – Floodproofing is a combination of structural and nonstructural additions, changes, or adjustments to structures, which reduce or eliminate risk of flood damage to real estate or improved real property, water and sanitation facilities, or structures with their contents.

Floodprone – Any land area or development that is susceptible to being inundated by floodwaters from any source.

Floodwater Management - Floodwater management includes actions to modify the natural flow of floodwaters to reduce losses to human resources and/or protect benefits to natural resources associated with flooding. For example:

- Containing flows in reservoirs, dams, and natural basins;
- Conveying flows via levees, channels and natural corridors;
- Managing flows through reservoir re-operation; and
- Managing watersheds by decreasing rainfall runoff, and providing headwater stream protection.

Floodway –

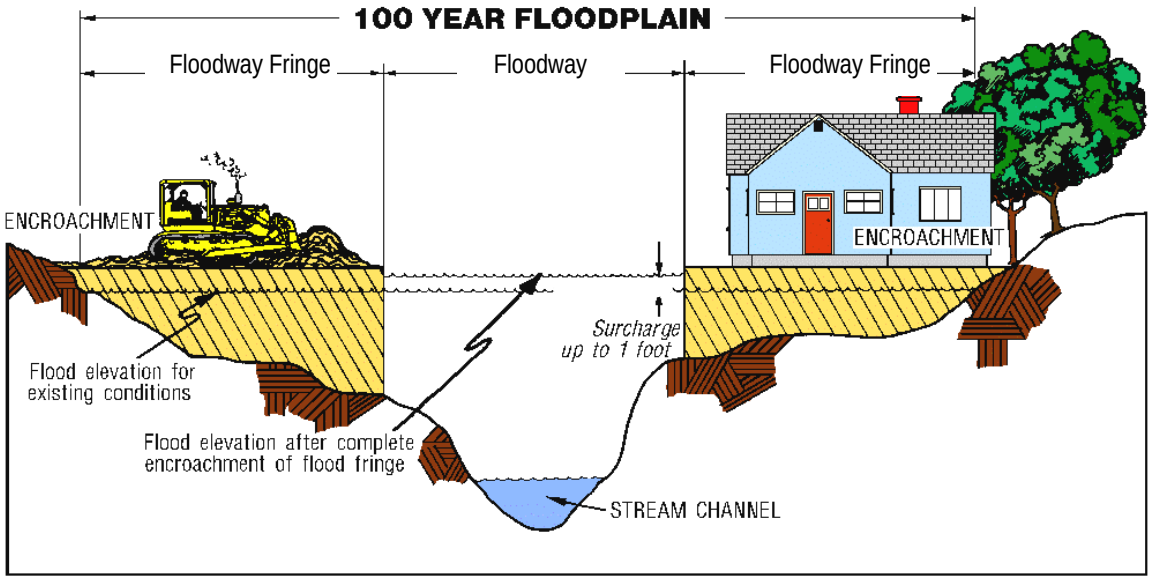
FEMA Definition: The channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

The Reclamation Board definition:

1- The channel of the stream and that portion of the adjoining floodplain reasonably required to provide for the passage of a design flood, as indicated by floodway encroachment lines on an adopted map; or

2- The floodway between existing levees as adopted by the Board or the Legislature.

Floodway Fringe – Floodway fringe is that portion of the 100-year floodplain adjoining the floodway in which limited encroachment is permissible.



Friends of the River – Friends of the River is dedicated to preserving, protecting, and restoring California's rivers, streams, and their watersheds. The organization accomplishes its mission by providing public education, citizen activist training and organizing, and expert advocacy to influence public policy decisions on land, water, and energy management issues.

General Plan Guidelines - An advisory document prepared by the Governor's Office of Planning and Research (OPR) to assist cities and counties in the preparation of local general plans.

Hazard Mitigation Grant Program – Authorized by the Federal Emergency Management Agency (FEMA), this program provides grants, to States and local governments, to implement cost-effective, long-term hazard mitigation measures, which will reduce or eliminate damage to lives or property, after a major disaster.

Hydraulic Modeling – Hydraulic modeling is a numerical or physical simulation of natural riverine conditions.

Hydrologic Modeling – Hydrologic modeling is a mathematical analysis of the flow of water and its components on some part of a surface or subsurface area.

Hydrologic modeling using transposition – Hydrologic modeling using transposition is a process that uses hydrologic data from adjacent or similar-characteristics watersheds for other watersheds that lack the data necessary for hydrologic modeling.

League of California Cities – The League of California Cities is an association of California city officials who work together to enhance their knowledge and skills, exchange information, and combine resources so that they may influence policy decisions that affect cities.

Lower San Joaquin Levee District - The Lower San Joaquin Levee District was created by the State Legislature in 1955, for the purpose of ensuring that the benefits of the Lower San Joaquin River Flood Control Project, paid for by the taxpayers, would not be lost and to provide protection to the people and the property for whom this project was designed. The project was designed and constructed by the State Department of Water Resources between 1959 and 1966. The project's purpose is to provide flood protection along the San Joaquin River and tributaries in Merced, Madera, and Fresno Counties. The plan covers 108 river miles, contains 195 miles of levees, and protects over 300,000 acres. The project is a series of bypasses built to collect San Joaquin flood flows, as well as floodwater from the Kings River system. The bypasses divert flows around stretches of the San Joaquin where constrictions impaired its capacity. The Levee District, in accordance with its agreement with the State Reclamation Board, is obligated to maintain not only the bypasses, but also the channel of the San Joaquin River within the project, in a condition where the channel will carry flood flows in accordance with the maximum benefits for flood protection.

Lowest Floor Elevation – The measured distance of a building's lowest floor above the National Geodetic Vertical Datum (NGVD) or other datum specified on the FIRM for that location.

Map Modernization Program - Established in 1997 to modernize FEMA's flood mapping program. The program intent is to reduce the average age of flood maps nationwide to six years (current average age is over a decade), produce digital mapping products for high priority areas, and reduce the number of unmapped communities by 50 percent.

Mapping Needs Update Support System (MNUSS) – The MNUSS program was developed by FEMA to inventory and evaluate local community mapping needs and is a tool that can be used to prioritize floodplain mapping needs. MNUSS is a software application that stores all identified needs nationally, performs a benefit cost analysis, and ranks the identified Map Maintenance Needs and Flood Data Update Needs for each community.

National Academy of Engineering – The National Academy of Engineering (NAE) mission is to promote the technological welfare of the nation by marshaling the knowledge and insights of members of the engineering profession.

National Flood Insurance Program (NFIP) – The National Flood Insurance Act of 1968 provides relief from the impacts of flood damages and established The National Flood Insurance Program (NFIP). The NFIP provides federally subsidized flood insurance to participating communities, contingent on flood loss reduction measures taken by local floodplain management regulations. The NFIP is designed to reduce future flood losses through state and local floodplain management efforts and to transfer the costs of residual flood losses from the general taxpayer to the floodplain occupant.

National Research Council – The National Research Council was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of further knowledge and advising the federal government. The National Research Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities.

National Wildlife Federation (NWF) – The National Wildlife Federation is the nation's largest member-supported conservation group, uniting individuals, organizations, businesses and government to protect wildlife, wild places, and the environment.

The Nature Conservancy – The Nature Conservancy was established in 1951 with the mission to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. The Nature Conservancy has protected more than 92 million acres worldwide.

Natural Corridor – A passageway of land and waters, which provides a refuge that will fulfill the needs of fish, wildlife, and plants that are native to ecosystems.

Natural Resources Defense Council (NRDC) – The Natural Resources Defense Council (NRDC) uses law, science, and the support of more than 500,000 members nationwide to protect the planet's wildlife and wild places and to ensure a safe and healthy environment for all living things.

Nonstructural approaches - Nonstructural methods include the use of regulations to prevent buildings from being constructed so they will not be subject to or damaged by flooding, as well as the removal of existing flood-prone buildings and the protection of open space along watercourses. Regulations are also used to limit new construction in floodplains and to prevent additional damage to existing developed flood-prone areas.

One Hundred (100-Year) Flood – A 100-year flood is a flood event that has a one percent chance of being equaled or exceeded in any given year. Also known as "base flood."

One percent (one percent flood) – See One Hundred Year Flood.

Paleo-flood records – Flood magnitude estimates developed from geophysical evidence rather than from stream gauge records or historic accounts. Holocene (post Ice Age) climate records are usually the most relevant records to use in judging the significance of paleo-flood records to potential flood magnitudes that might be seen in the remaining several thousand years of this interglacial climate period.

Reasonably Foreseeable Flood – A reasonably foreseeable flood is a flood event that is realistically probable for a particular area. In many cases, this event could exceed a predicted "100-year" flood. It is important to note that the determination of a reasonably foreseeable flood can vary depending on its use and application for any given area. Sources of information on reasonably foreseeable floods may include historic floods, paleo-floods, hydrologic modeling using transposition, historical flood damage data, and hydrologic models. Communities such as Sacramento, West Sacramento, Yuba City, Marysville, Los Angeles, and Orange County are all working toward protection against floods that exceed the "100-year floods." It is up to each community to consider this information in making land use and flood management decisions.

The Reclamation Board – The Reclamation Board was established to control flooding along the Sacramento and San Joaquin Rivers and their tributaries in cooperation with the U.S. Army Corps of Engineers, cooperate with various agencies of the federal, State and local governments in establishing, planning, constructing, operating, and maintaining flood control works and maintain the integrity of the existing flood control system and designated floodways through the Board's regulatory authority by issuing permits for encroachments.

Repetitive Losses – Repetitive losses are two or more losses that occur within ten years and each with a cost greater than $1,000.

Reservoir – Reservoir is a place where water is stored as an artificial lake where water is collected and kept in quantity for use.

The Resources Agency of California – The California Resources Agency is responsible for the conservation, enhancement, and management of California's natural and cultural resources. The Resource Agency is composed of departments, boards, conservancies, commissions, and programs.

Riparian – Riparian is relating to, located on, or living/growing on the bank of a natural watercourse such as a river, lake or tidewater.

River Basin – The geographical area drained by a river and its tributaries.

Riverine flooding - A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland rivers.

The Sacramento Area Flood Control Agency - A coordination group of regional flood control projects and legislation. This particular agency consists of the City of Sacramento, the Counties of Sutter and Sacramento, Reclamation District 1000, and the American River Flood Control District.

Sacramento-San Joaquin River Basins Comprehensive Study – A description of preferred flood management approaches to be locally or regionally implemented as a master plan for flood damage reduction and ecosystem restoration in California's Central Valley.

Sacramento-San Joaquin River Delta – The Sacramento and San Joaquin River Delta is located at the confluence of the Sacramento and San Joaquin Rivers. The Delta covers over 700,000 acres and is a major collection point for California waterways. The Delta receives runoff from 40 percent of California's land area and is the major water source for almost two-thirds of California's population. Much of the Delta's land is located 20 feet below sea level and is protected by an extensive levee system.

Safe Harbor Policy – Safe Harbor agreements are voluntary arrangements between the U.S. Fish and Wildlife Service or National Marine Fisheries Service and cooperating non-Federal landowners. The agreements benefit endangered and threatened species while giving the landowners assurances from additional restrictions. After the development of the agreement, the U.S. Fish and Wildlife Service will issue an "enhancement of survival" permit, to authorize any necessary future incidental take to provide participating landowners with assurances that no additional restrictions will be imposed as a result of their conservation actions.

Southern California Associated Governments - The designated Metropolitan Planning Organization (for six counties: Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial), is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.

Special Flood Hazard Area – A FEMA NFIP term for the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. Special flood hazard area maps may not accurately describe lands that are prone to flooding.

Stakeholder Policy Committee – The Stakeholder Policy Committee conferred with the Comprehensive Study team to identify potential barriers and recommendations for implementing the Sacramento and San Joaquin River Basins Comprehensive Study's Comprehensive Plan. The Stakeholder Policy Committee submitted recommendations to the Reclamation Board in "Reforming Existing Flood Management Institutional Policies for Public Safety and Ecosystem Restoration." The recommendations were developed during a series of bi-weekly meetings in 2001-2002.

Structural Approaches - Structural methods include construction of floodwalls and levees, and techniques to make structures more resistant to water penetration and pressure.

Substantial Damage – An NFIP term referring to damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. In NFIP communities, if substantially damaged structures are rebuilt, the new structure must comply with NFIP design or location standards.

Subventions Program - The State Legislature established a policy of financial assistance to local agencies cooperating in the construction of federal flood control projects. State reimbursement ranges from a minimum of 50 percent to a maximum of 70 percent depending on the project's multipurpose features.

United States Army Corps of Engineers (USACE) – The United States Army Corps of Engineers (USACE) is made up of civilian engineers, scientists and other specialists who work with leaders in engineering and environmental matters. The USACE includes approximately 34,600 civilians and 650 military men and women.

United States Environmental Protection Agency (USEPA) – The United States Environmental Protection Agency (USEPA) is a federal agency that provides leadership in the nation's environmental science, research, education, and assessment efforts. USEPA works closely with other federal agencies, state and local governments, and Indian tribes to develop and enforce regulations under existing environmental laws.

United States Water Resources Council – The Water Resources Planning Act established the United States Water Resources Council in 1962. The U.S. Water Resources Council includes the Secretaries of Interior, Agriculture, Army, Health, Education and Welfare, and the Chairman of the Federal Power Commission, with the heads of other agencies participating on matters affecting their responsibilities are to be considered by the Council. The Act required the Council to establish principles, standards, and procedures for federal participants in the preparation of comprehensive regional or river basin plans and for the formulation and evaluation of Federal water and related land resources projects.

Watershed – A watershed is a region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water.

Watershed Management – Watershed management is a process of decision-making regarding uses and modifications of lands and waters within a watershed. This process provides a chance for stakeholders to balance diverse goals and uses for environmental resources, and to consider how their cumulative actions may affect long-term sustainability of these resources. As a form of ecosystem management, watershed management encompasses the entire watershed system, from uplands and headwaters, to floodplain wetlands and river channels

Western Governors' Association (WGA) – The Western Governors' Association (WGA) serves the governors of 21 Western States and US-Flag Pacific Islands. WGA develops policy and carries out programs in the areas of natural resources, the environment, human services, economic development, international relations, and state management. WGA helps Governors to develop strategies for long- and short-term issues and to develop and advocate policies that reflect regional interests and consensus.

Wetlands – Areas in which water saturation determines the nature of soil development and the types of plant and animal communities living in the soil.

Wildlife friendly agriculture – Management practices used by farmers and ranchers to support wildlife. Examples include planting or maintaining riparian vegetation, insectivory hedgerows, native grass plantings around field edges, cover crops, installing owl nest boxes and bat roost structures, and winter flooding of harvested fields.

APPENDIX B - Proposed Comments on the California State General Plan Guidelines

The following is a redline strikeout version of the text on page 127 of the 2002 preliminary draft *General Plan Guidelines*. All new text is underlined.

FLOOD~~PLAIN~~ MANAGEMENT

Introduction

Flood Management

Flood management is defined as the overarching term that encompasses both floodwater management and floodplain management.

Flood Water Management

Floodwater management includes actions to modify the natural flow of floodwaters to reduce losses to human resources and/or protect benefits to natural resources associated with flooding. For example: containing flows in reservoirs, dams, and natural basins; conveying flows via levees, channels and natural corridors; managing flows through reservoir re-operation; and managing watersheds by decreasing rainfall runoff, and providing headwater stream protection.

Floodplain Management

Floodplain management includes actions to the floodplain to reduce losses to human resources within the floodplain and/or protect benefits to natural resources associated with floodplains and flooding. For example: minimizing impacts of flows (e.g. flood-proofing, insurance); maintaining or restoring Natural Floodplain Processes (e.g. riparian restoration, meander corridors); removing obstacles within the floodplain voluntarily or with just compensation (e.g. relocating at- risk structures); keeping obstacles out of the floodplain (e.g. planning, mapping, and zoning land use decisions); educating and emergency preparedness planning (e.g. emergency response plans, data collection, outreach, insurance requirements); ensuring that operations of floodwater management systems are not compromised by activities that interfere with, or are damaged by, design floods of these systems.

Floodplain management measures interrelate and occasionally overlap with floodwater management measures to reduce losses within the floodplain. For example: emergency response activities; realigning levees; reconnecting historical floodplains; and reoperation of reservoirs.

Multi-hazard Mitigation Approach

Federal law directs states to develop a multi-hazard mitigation program (administered by the Governor's Office of Emergency Services) to implement effective hazard mitigation measures that reduce the potential damage from natural disasters to reduce the loss of life and property, human suffering, economic disruption and disaster assistance costs resulting from natural disasters. While the State directs local governments through existing law to deal with fire and earthquakes in their local planning, the State does not play a major role with land use issues associated with flooding (Fulton). The general plan law calls for the consideration of flood hazards, flooding, and floodplains in the land use, open-space, conservation, and safety elements. Local jurisdictions may benefit by doing a multi-hazard planning approach to meet multiple federal and state requirements.

Flood management also may be approached as a stand alone program or as one component of the broader notion of watershed planning, which also includes objectives such as improved water quality, erosion control, system-wide flood management and habitat conservation and enhancement. Where possible, a community should take a broader watershed approach to flood management, which would result in a coordinated regional approach to land use planning and flood loss reductions. When incorporated into the general plan, either as an optional element or as a section in the land use, open-space, conservation, or safety element, flood management principles will be reflected as long-term development policies.

Floodplain Functions

Flooding is a natural function of every river, alluvial fan and coastal area.
In the riverine systems, floodwaters enrich bottomlands and provide spawning habitats for native fish. There are ecological benefits of maintaining connections between the river and its floodplain.

Land use decisions directly influence the function of floodplains and may either reduce or increase ecosystem health and potential flood hazards. The functions of floodplains include, but are not limited to, water supply, improved water quality, flood and erosion control, and fish and wildlife habitat. Development within floodplains may not only expose people and property to floods, but also increase the potential for flooding elsewhere and may negatively impact floodplain ecosystems. Land use regulations such as zoning and subdivision ordinances are the primary means of implementing general plan policies established to minimize flood hazards. In addition to including floodplain management policies in the general plan, making related changes to zoning and subdivision ordinances is crucial to the success of a floodplain management program.

The following flood management element guidelines will discuss flood management at both the individual community level and the regional level. They are equally useful in situations where a city or county has unilaterally included flood management in its general plan, or where an individual jurisdiction's flood management element is part of a larger regional strategy to be implemented by more than one agency.

Guidelines for Flood Management Programs

Relationship to the General Plan

Flood management may be addressed in an optional element pursuant to §65303 of the Government Code. Once adopted, the flood management element becomes an integral part of and carries the same weight as the other elements of the general plan. Its objectives, policies, plan proposals, and implementation measures must be consistent with the entire general plan (§65303.5). The objectives and policies, which are adopted as part of the flood management element must not conflict with the general plan as a whole, or with any individual element. A floodplain management element should provide direction and specific policies correlated with the land use, housing, conservation, safety, and open-space elements. For example, policies limiting development within the floodplain to compatible agricultural uses must also be reflected in the and internally consistent with land use, housing, open-space, and conservation elements. Policies regarding levee and channel maintenance might be reflected in the safety element. Many of the provisions under flood management will affect other elements of the general plan, and they should be cross-referenced as necessary.

Where a regional approach is being taken, the policies of a city or county's flood management element should also correlate to the regional flood management plan. That plan should be specific enough to recognize the differing characteristics of each of the involved cities and counties and identify the respective roles ~~of each~~ and obligations of each within all elements of the *General Plan*. The regional plan may stipulate that participating cities and counties self-certify the consistency of their flood management elements with the regional plan.

Relationship to CEQA

The adoption or amendment of a floodplain management element is subject to the requirements of CEQA (described in Chapter 4). The element may have direct physical consequences on residential development, wildlife habitat, anadromous fish migration, agricultural resources, vector control, water quality, and other environmental resources common to rivers and their floodplains. The hydrologic and hydraulic characteristics of the rivers and associated floodplains and ecosystems, of each river basin or hydrologic unit represent a complete and interconnected system. Changes to one part of the system may change other parts of the system. Floodwater and floodplain approaches must consider these factors. There may be flood management benefits from a watershed perspective for assessing potential impacts and opportunities for mitigation measure.

Flood Insurance

The most common means of planning to avoid or at least mitigate flood damage is participation in the federal flood insurance program. The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP), which makes flood insurance available to those communities, which have enacted local ordinances restricting development within the 100-year floodplain. The local floodplain ordinances must meet or exceed FEMA's regulations. As part of its program, FEMA prepares a Flood Insurance Rate Map (FIRM) delineating the theoretical boundaries of the 100-year floodplain (the area within which the statistical frequency of flooding is believed to be 1 in 100 in any given year). These maps form the basis for regulating floodplain development and the rating of flood insurance policies.

The responsibilities of cities and counties participating in the NFIP include requiring that all new construction have its lowest floor elevated to or above the "base flood elevation" (this is calculated in conjunction with the 100-year floodplain delineation) and keeping records of development occurring within the designated floodplain. Under federal law, flood insurance must be purchased when obtaining a federally backed loan for a home within the FIRM 100-year floodplain. The availability of other federal funds also may be affected by participation in the NFIP program. The city or county must submit a biennial report to FEMA describing any changes in the community's flood hazard area, development activities which have taken place within the floodplain, and the number of floodplain residents and structures. As of April 1998, all but 20 of the cities and 1 of the counties in California participate in the NFIP.

Participating in the NFIP is no guarantee that a community will escape flood damage, or that floods will not occur outside the boundaries of mapped floodplains. The program has a number of recognized shortcomings: FEMA maps tend to underestimate the extent of the floodplain. For example, existing FIRM maps do not take into account the effects of future development when estimating flood potential. And the FIRM maps are not updated frequently enough to reflect changes in the watershed or floodplain with or without future conditions. New FEMA regulations allow FIRM maps to provide for consideration of future conditions including "build-out" and changes to weather patterns associated with climate changes for either upstream or downstream areas, which may affect local flood levels. If these maps are to be used as a planning tool, they should be updated using locally collected data to identify existing and future flood levels. The Department of Water Resources (DWR) is currently working to update many of these maps, in cooperation with FEMA.

Residents and decision-makers are not always aware of the actual level of flood risk. The 100-year floodplain is a theoretical construct - in many cases there is simply insufficient historical flood data to accurately judge flood frequency. In addition, the 100-year floodplain designation is commonly misunderstood by the public - it is simply a frequency and intensity probability, meaning that in reality, severe flooding may occur even more than once in any year, and any number of years in over a 100 year span. The NFIP and related floodplain mapping is a program for a community to seek flood insurance and should be viewed as the foundation on which to build comprehensive flood management policies. The general plan may augment this program by providing long-range guidance to avoid and reduce flood hazards.

Flood Management on a Regional Basis

Rivers, creeks, and other potential sources of flooding often cross-jurisdictional boundaries and thus a regional, watershed-based approach may be the effective means of flood management. The broader scope offers the advantage of involving local governments, other public agencies, interest groups, landowners, and the general public throughout the watershed in a comprehensive, multi-jurisdictional program for reducing flood risk and potential damages and restoring and enhancing floodplain functions. The larger area may offer a wider range of potential projects, policy and regulatory options than would be available in a single jurisdiction. Nonetheless, regional flood management is also more politically and logistically difficult than management undertaken within a single jurisdiction.

As a component of watershed management, flood management reduces downstream flood stages and flood damages with benefits for water quality, water supply, agriculture and ecosystems. The watershed-based approach maintains the floodplain functions of sedimentation, deposition, water filtering, and floodwater absorption. See page **104-105** for additional discussion on watershed planning.

No two situations are alike, and the dynamics of regional flood management are very situation-specific. For that reason, the following discussion of regional approaches is limited to generalities. For additional advice, see the reference sources listed in the Technical Assistance section.

Successfully developing a regional flood management plan that includes floodplain strategies depends on the existence of several basic prerequisites. There must be:

- General recognition that there is a regional flooding problem that requires a solution;
- Some impetus for the involvement of critical agencies and interest groups in the search for a solution;
- A willingness among the involved agencies and interest groups to work toward a consensus solution;
- At least one person, group, or agency that will sponsor or champion the process;
- A range of feasible and practical solutions available;
- A reasonable possibility that funding exists to pay for the necessary planning, as well as follow-up funding to implement the accepted plan; and
- Specific criteria to measure the effectiveness of plan implementation.

Few of the regional flood management efforts currently being implemented around the state, including watershed management programs, are directly linked to city and county general plans. In fact, city and county land use planning agencies are often conspicuously low on the list of participants. When possible, city and county planners should take an active, ~~lead~~ role ~~part~~ in any regional flood management planning process. The local general plans, as well as zoning and subdivision ordinances, can play an important part in a comprehensive, multi-jurisdictional program for flood management. Cities and counties should amend their general plans and revise their zoning and subdivision ordinances when agreed to as part of a regional effort.

Methodology

The process of adopting a flood management element is essentially the same as any other element of the general plan and must follow the procedures set forth by §65350 and §65400 of the Government Code. Under state law, the planning agency must provide opportunities for involvement by residents, public agencies, public utility companies, and other community groups through public hearings and any other means found to be necessary or desirable. The planning agency should include in its process affected cities and counties, FEMA, the U.S. Army Corps of Engineers, the California Department of Water Resources (DWR), The Reclamation District, levee districts, resource conservation districts, and interest groups including

environmentalists, farmers, builders, as well as any non-governmental organization (i.e. land trust, local or other conservancy, etc.) which might have an interest in floodplains.

Establishing a steering committee may be useful. The committee can help identify floodplain issues and community objectives, develop policies, and draft the element. Members of the committee should be selected from among representatives of interested groups, agencies, organizations, and residents. Alternatively, a separate technical advisory group may also be established from among agency representatives. See Chapter 2 for a discussion of advisory committees.

The general plan may be adopted in any format deemed necessary or appropriate. A well-written general plan will serve as a constant reference for decisions regarding the physical development of the community including its floodplains. Floodplain management is interrelated with most, if not all, of the other required elements. The Office of Planning and Research recommends taking particular care to correlate floodplain management objectives and policies with those of the land use, open-space, conservation, and safety elements.

Relevant Issues

When a flood management element is being prepared, the issues covered should be limited to those, which are relevant to the community, the floodplain, and the watershed. Clearly, the subjects covered by the flood management element will depend upon the community's location in relation to rivers and streams, alluvial fans or the coast past or future potential for flood events, and the potential to be affected by upstream or to impact downstream land use decisions and flood potential. Following are a variety of issues, not all of which will be relevant in every jurisdiction. These are simply some common ideas; they are not intended to be an all-inclusive list.

- OES Multi-hazard Mitigation Plan
- The reasonably foreseeable flood area
- FEMA NFIP program and community rating system (to reduce flood insurance rates)
- DWR Awareness Mapping and other historical flooding resources
- Repetitive losses
- Land use designation and flood hazard overlay designations
- Flood control facilities (e.g., structural approaches to flood management such as dams, levees, etc.)
- Floodplain management approaches (nonstructural including elevation, floodproofing, floodplain storage)
- Conformity with federal, state, and local regulations
- Regulatory relationships, including permitting
- Multi-jurisdictional coordination and watershed planning
- Downstream impacts as consequences of land use decisions
- Downstream land use planning considerations (flood hazards and infrastructure) as consequences of upstream actions
- Alternative non-structural allowable floodplain land uses
- Multi-objective floodplain management planning with regional share housing needs, existing land uses, conservation of agricultural land, parks and open space, habitat protection and restoration, and flood management mitigation measures.
- Funding of management activities

Ideas For Data and Analysis

In the process of preparing a flood management element, the city or county will have to collect a substantial amount of information concerning its floodplains and its watershed. There are a variety of sources for this

information. FEMA maps are available for most communities. The U.S. Army Corps of Engineers will do floodplain delineation on a cost-sharing basis and has information on floodplains and project levees. DWR also has floodplain information and a floodplain management program, as does the State Reclamation Board in the Central Valley. The Office of Emergency Services and DWR have information on past flooding and flood levels based on awareness mapping. Local levee districts and Resource Conservation Districts may also have information to share.

The following are ideas for data and analysis to support the development of objectives, policies, and implementation measures for this element.

- Comprehensively define the floodplain (FEMA v. Army Corps of Engineers v. State Reclamation Board v. local agency definition)
- Extent and depth of historic flooding (maps)
- Historical flooding data
    - Frequency
    - Intensity
    - Duration
    - Pale flood
    - Hydrologic modeling using transposition or meteorological models
- Alluvial Fan Floodplain data
    - Reasonably foreseeable flood apex flow paths
    - Flood flow path depths and velocities
    - Debris and scour
- Inventory land and land uses with the floodplain(s)
    - Open-space
    - Habitat
    - Wildlife migration corridors
    - Agricultural
    - Flood control
    - Developed (i.e., residential, commercial, industrial
- Identify existing and future problems and opportunities
    - Development within hazard areas
    - Undeveloped land suitable for bypass construction
    - Loss of productive farmland and opportunities for conjunctive farming and floodplain management activities
    - Community apathy or support
    - Funding shortfalls
- Boundaries of floodplains (FEMA v. U.S. Army Corps of Engineers v. DWR v. local agency)
- Inventory flood control structures and areas managed for flood control, and their controlling agencies
    - Levees
    - Flood walls
    - Bypasses
    - Dams/reservoirs
- Inventory pertinent regulations of federal, state, and local agencies
    - Regulatory authority
    - Existing land use and zoning restrictions
- Inventory ongoing floodplain or watershed management and planning activities
    - Local/regional, including those of non-governmental organizations
    - State

  - Federal
- Inventory past, and planned management activities
  - Local agencies
  - Reclamation Districts
  - State and federal agencies
- Identify sources of funding for planning efforts, as well as for potential implementation activities
- Benefit/cost analysis of alternative floodplain management strategies

Ideas for Flood Management Development Policies

A flood management element should conform to the pertinent policies, objectives, plans, and proposals central to the land use, conservation, open-space, and safety elements. Policies should recognize existing floodplain management programs as well as existing regulations. As always, policies must conform to constitutional prohibitions on "regulatory takings." Further, the policies selected should be physically and economically feasible to implement.

Following are ideas for the general types of policies, which may be incorporated into the flood management element.

- Specify allowable uses within the floodway fringe and floodplains
- Specify limits on ~~and construction standards for~~ development and encroachment within ~~mapped~~ floodplains and floodway fringe (land use density, intensity, elevations, location), including areas of shallow flooding
- Establish policies, plan proposals, and standards for dealing with constraints and minimizing land use and floodplain conflict
- Retain and preserve floodplains for open-space and recreation
- Encourage compatible agricultural uses and practices with habitat banking where compatible with floodplains
- Mitigate for impacts such as loss of agricultural land, loss of native habitat, or changes in flood characteristics
- Cooperate with the programs of other agencies and non-governmental organizations, where applicable
- Establish consultation procedures with other affected agencies and jurisdictions
- Identify criteria for public agency acquisition of development rights in floodprone areas
- Encourage cooperation with non-governmental organizations to acquire development rights
- Establish policies, guidelines, ~~standards and building criteria~~ to ensure that new development will not be damaged by special risks associated with alluvial floods.
- Encourage multi-jurisdictional flood management cooperation when watersheds cross-jurisdictional boundaries
- Develop flood hazard mitigation measures within identified reasonably foreseeable flood hazard areas where appropriate
- Encourage coordination between flood management and multi-hazard management planning and mitigation
- Retain and preserve connectivity between rivers or streams and their floodplains to preserve floodplain function and natural processes.

Ideas for Implementation

Local agencies should select a combination of implementation measures or strategies that best address the unique characteristics of the specific community and establish an effective long-term approach to floodplain

management. The following examples illustrate the kinds of actions local governments may take to implement the floodplain management element.

- Adopt flood hazard zoning
- Enact floodplain management standards as part of any zoning or land use ~~the subdivision~~ ordinance
- Consider new and substantially-improved buildings to exceed minimum federal flood insurance requirements
- Adopt transfer of development rights programs
- Adopt other land use development regulations
- Reconnect the river and its floodplain through public land acquisition and structural modification of existing flood control devices
- Include nonstructural floodplain management approaches to help conserve beneficial uses and functions of the floodplain
- Identify capacity of floodplain to recharge groundwater
- Access technical assistance from DWR for identifying existing local and/or FEMA floodways
- Develop a program for preventative maintenance of active floodplains, control structures, river banks, and channels to balance the need to ensure continued flood capacity and stability ~~consistent~~ with the needs of established native habitat
- Identify and utilize floodplain management grants and assistance to develop and implement floodplain management plans and programs
- Develop public outreach programs and information
- Incorporate watershed and floodplain mapping, from several sources if available, into the city or county Geographic Information System (GIS)
- Regularly review floodplain maps, and update with future conditions when new information becomes available
- Participate in and provide assistance to stream gauges as appropriate
- Develop reasonably foreseeable alluvial fan floodplain maps
- Public development and redevelopment policies
- Cooperate with OES and DWR to identify repetitive losses if any
- Prepare and update emergency preparedness plans
- Direct local emergency services offices to develop and implement flood warning systems
- Establish resources and provide funding for public acquisition of private lands and structures within the floodplain and subject to flood hazards.
- Institute a planning mechanism and institutional framework to coordinate flood management programs with opportunities for agricultural conservation and ecosystem protection and restoration ~~control~~ and environmental management activities with local, state, federal agencies, and other stakeholders
- Promote multi-objective management approach in flood management projects
- Initiate actions to avoid inadequate or unclear responsibilities between agencies
- Enter cooperative agreements (JPA, MOU) with other entities specifying relative roles
- Facilitate the coordination of responsibilities and activities among agencies and the public for floodplain management
- Develop aquatic and terrestrial habitat restoration plans consistent with floodplain and river channel use guidelines
- Develop information and coordination plans with other agencies to educate the public and all planning agencies about floodplain management objectives
- Refer to FEMA DMA 2000 Multi-hazard mitigation Plan Criteria (source).
- Develop Awareness Mapping

Technical and Funding Assistance

The following governmental and nongovernmental organizations can provide information or assistance for the preparation of the *safety element*: add: Department of Water Resources, Flood Division for Awareness Mapping, Community Rating Systems program, and Floodplain Management, Governor's Office of Emergency Services, FEMA; Association of State Floodplain Managers, and American Planning Association. [See 1998 *Guidelines* for original section].

Floodplain Management Association
P.O. Box 50891
Sparks, NV 89435-0891
http://www.floodplain.org/

United States Army Corps of Engineers
Floodplain Management Services
South Pacific Division
630 Sansome Street, Room 720
San Francisco, CA 94111
(415) 556-0914
http://www/usace.army.mil/inet/functions/cw/cwfpms
Funding Mechanisms: Congressionally Authorized Civil Works Projects, Floodplain Management Services, Small Flood Control Projects, Snagging and Clearing for Flood Control, Streambank and Shoreline Protection for Public Facilities

Federal Emergency Management Agency (FEMA)
1111 Broadway, Suite 1200
Oakland, CA 94607
(510) 627-7100
http://www.fema.gov/home
Funding mechanisms: Hazard Mitigation Grant Program, Public Assistance Section 406, National Flood Insurance Program, Performance Partnership Program, Community Assistance Program-State Support Services Element, Individual and Family Grant Program, Disaster Housing Assistance Program

Governor's Office of Emergency Services
Planning and Technological Assistance Branch
P.O. Box 419047
Rancho Cordova, CA 95741-9047
(916) 464-3200
or
Disaster Assistance Programs Branch
Hazard Mitigation Section
P.O. Box 419023
Rancho Cordova, CA 95741-9023
http://www.oes.ca.gov
Funding Mechanisms: Hazard Mitigation Grant Program

California Department of Water Resources
Floodplain Management Branch
P.O. Box 942836
Sacramento, CA 94236-0001
(916) 653-9902
http://wwwdwr.water.ca.gov

United States Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105
http://www.epa.gov
Funding under the Clean Water Act: 104(b)(3) State Wetland Protection Development Grant; 104(b)(3) NPDES demonstration projects

United States Department of Agriculture
Natural Resource Conservation Service
430 G. Street, #4164
Davis, California 95616
http://www.nrcs.usda.gov

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Cost Effectiveness Analysis For Environmental Planning: Nine Easy Steps, U.S. Army Corps of Engineers, Alexandria VA, 1994
Community Flood Mitigation Planning Guidebook, Wisconsin Department of Natural Resources, Madison WI, 1995
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APPENDIX C - Executive Order Options

Proposed California Floodplain Management Executive Order Revision
Please Note: Exceeds NFIP minimum standards -- more protective language underlined applies only to "NOW THEREFORE" portion, not "WHEREAS" portion

Executive Department
State of California
EXECUTIVE ORDER D- _ _ - 02
(Replaces Executive Order B-39-77)
Revised 11-15-02

WHEREAS, throughout the State repetitive floods continue to jeopardize those who live in floodplains, and cause devastating losses, major risks and increase costs to California's people, property, environmental, social and economic interests, and;

WHEREAS, past and future floodplain management decisions will be an increasingly important consideration as the State's population and development continues to outpace the construction and maintenance of physical floodwater management facilities used to reduce flood damage to floodplain developments; and

WHEREAS, a more determined implementation of floodplain management would mitigate the traditional and costly cycle of allowing inappropriate uses in floodplains which in turn creates the justification for additional physical floodwater management facilities; and

WHEREAS, adherence to floodplain management also protects natural resources such as wetland and riparian habitat which have been significantly reduced and require protection; and

WHEREAS, prudent floodplain management values agricultural land, water resources and floodplain functions that are essential to the existing environment and necessary for our State's floodplains' continued ability to provide a safe, healthy and affordable food supply, which is vital for our national security and public welfare; and

WHEREAS, appropriate pre-flood floodplain management effort will reduce post-flood displacement, disruption, and federal and State financial disaster assistance; and

WHEREAS, the State should provide leadership by example to decision-makers to develop and support prudent floodplain management policies; and

WHEREAS, the State has programs for the construction, operation, or permitting of facilities and surplus State lands' conveyance which can directly or indirectly affect land use planning and development in floodplains; and

WHEREAS, the National Flood Insurance Act of 1968 as amended provides that State or local governments that do not adopt floodplain management regulations consistent with at least the minimum standards of the National Flood Insurance Program cannot participate in the National Flood Insurance Program and will not be eligible for any federal financial assistance, including federal disaster assistance and USDA and HUD funding, for buildings located in FEMA's regulatory floodplains in that community; and

WHEREAS, the availability of federal financing for buildings and their contents, flood insurance and disaster assistance is of importance to the residents of California.

WHEREAS, the purchase of flood insurance is a condition of any federal financial assistance for any State or local government in the construction, or acquisition of buildings in identified floodplains; and

WHEREAS, the United States Code at 42 U.S.C. 4106 (a) specifically prohibits Federal officers and agencies from providing financial assistance for acquisition or construction purposes for use in the floodplains of a State, local government, or other specified public entity that is not participating in the National Flood Insurance Program; and

WHEREAS, laws have been enacted since the original 1977 version of this Order including the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, as amended, the Housing and Community Development Act of 1992, the Reigle Community Development and Regulatory Improvement Act of 1994, and others, and the State desires to provide leadership in multi-objective management of floodplains and the protection, restoration and enhancement of other natural and beneficial functions of the floodplain; and

WHEREAS the Legislature has declared in Water Code section 8325 that a large portion of the land resources of the state is subject to recurrent flooding causing loss of life and property, and there is a recognized public need in the state for flood insurance; and

WHEREAS the Legislature has declared in Water Code section 8325 that the public interest will be served by state cooperation under the National Flood Insurance Program; and

NOW THEREFORE, I, Gray Davis, Governor of the State of California, by virtue of the power and authority vested in me by the Constitution and statutes of the State of California, do hereby issue this Executive Order to supercede Executive Order B-39-77, effectively immediately.

1. Policies and priorities identified in this order further the State of California's cooperation with the National Flood Insurance Program, and hence promote the public interest, consistent with the Legislature's declarations in Water Code section 8325. The policies and priorities identified in this Order are not intended to amend the effect of, or to qualify the operation of existing laws and regulations.

2. Consistent with its legal authority, if a State agency has determined to, or proposes to, conduct, support, or allow development, as defined by the State's Executive Order, Note 4, to be located in the floodplain and which is not subject to local floodplain management requirements, the State agency should be encouraged to consider alternatives that avoid or minimize adverse effects and incompatible development in the floodplain.

3. With respect to State lands and State structures, State agency officials shall provide leadership and shall make decisions consistent with long- and short-term flood risk in order to avoid or minimize the social disruption, environmental, and economic losses associated with the use of floodplains. These agency officials shall take particular care to avoid nonconforming or hazardous use of floodplains in connection with all activities under their authority.

***Note 1**: In this Executive Order the term "floodplain" means "Special Flood Hazard Area" which includes both Zone A (Riverine/Alluvial) and Zone V (Coastal) flooding as shown on FEMA's Flood Hazard Boundary Maps (FHBM) and Flood Insurance Rate Maps (FIRM) or The Reclamation Board's Designated Floodways as shown on The Reclamation Board maps.* The term "floodplain" includes both traditional floodplains and floodways.

***Note 2:** There are certain areas not mapped for regulatory purposes by the NFIP or The Reclamation Board, which may be flood-prone areas. These include unmapped floodplains, whose existence is demonstrated by historic flooding or credible hydrological and hydraulic data, and floodplains indicated by Awareness Maps, or other relevant studies, including reasonably foreseeable flood mapping. All obligations in this Executive Order related to "floodplains" also include consideration of these flood-prone areas. "Reasonably foreseeable flooding", as used in this order, is an estimate of the range of foreseeable flood*

magnitudes developed for floodplain and flood management purposes, which utilizes all available sources of flood related information, including but not limited to, historic floods, hydrologic modeling using transposition, hydraulic models, meteorological models, and evaluation of the 1 percent frequency flood design standards.

Note 3: *In this Executive Order, "state structure" means new or substantially improved buildings or improvements that are not subject to local government floodplain management requirements and that the state constructs, substantially improves, or owns.*

Note 4: *In this Executive Order the term "development", as defined by NFIP, means any human-made change to improved or unimproved real estate, including but not limited to buildings, or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials where the State constructs, improves, or owns and the activity is not subject to local floodplain management requirements.*

Note 5: *"Critical Infrastructure" means public facilities that are critical to the health and welfare of a population and to disaster response to a hazard event. Critical infrastructure should be presumed to include facilities that if rendered unserviceable, would impose significant hardship on the public, or that if flooded would pose a threat to public health and public safety. Critical Infrastructure includes but is not limited to emergency response facilities (such as OES, fire and police), hospitals, water purification facilities, sewer treatment facilities, and could include transportation, energy, communication, and power facilities.*

These obligations should be implemented as follows:

a. All State agencies responsible for development other than issuing State permits for financing, planning, designing or constructing of non-State development, shall evaluate flood hazards when planning the location of these developments. The evaluation shall consist of a determination of whether the proposed site lies in a floodplain, and, if so, that the precautions identified in this Executive Order will be taken to minimize the hazard. If the development does not have to be in the floodplain to meet its goals and objectives, feasible alternative locations for siting outside of the floodplain shall be given priority consideration unless the location in the floodplain is necessary because it is substantially more cost-effective, practical, or appropriate for the proposed use of the development or the benefits of floodplain functions. If development occurs in the floodplain, floodproofing should be considered and implemented, if appropriate.

b. All new development by State agencies proposed in floodplains must at a minimum be constructed and maintained in accordance with federal and State regulations and local floodplain management ordinances, which include, but are not limited to, the National Flood Insurance Program design and floodplain standards set forth in the Code of Federal Regulations (44 CFR, Parts 60.3, 60.4 and 60.5); and amendments thereof after the date of this Executive Order; the Appendix (Chapter 31) of the 1997 (or later) edition of the Uniform Building Code (or equivalent provision as adopted by reference in the California Building Code, and the regulations of The Reclamation Board (Title 23). Where there are established differences among federal, state and local floodplain regulations, State agencies, at their option, shall abide by either this Executive Order or more protective local regulations enacted to protect the public health, safety, and welfare. In the siting, design, and construction of State structures in floodplains, state agencies generally should strive to exceed NFIP design standards in accordance with a complete flood risk analysis of a site and preserve natural floodplain functions and benefits to the extent feasible. To emphasize the importance of adhering to floodplain management regulations, which will reduce future flood risk and damage, State agencies shall follow this Executive Order in the development and promulgation of guidelines and regulations.

~~c.~~ All State agencies with existing State-owned, or State-operated developments in floodplains that suffer significant or repetitive flood damage, shall at a minimum carry out or require reconstruction, rehabilitation, or additions in accordance with federal ordinances, including the National Flood Insurance Program's design and floodplain standards set forth in the Code of Federal Regulations, and this Executive Order, or not perform reconstruction, rehabilitation, or additions if that work is not cost-effective, practical or appropriate for that development. Whenever cost-effective, practical

and appropriate, floodproofing and flood protection measures shall be applied to existing developments in floodplain areas which have not suffered significant or repetitive flood damage. Where there are established differences among federal, state and local floodplain regulations, State agencies, at their option, shall abide by either this Executive Order or more protective local regulations. In undertaking these actions, state agencies generally should strive to exceed NFIP design standards in accordance with a complete flood risk analysis of a site, including reasonably foreseeable floods, and preserve natural floodplain functions and benefits to the extent feasible.

d. All State agencies responsible for the lease and other conveyance of surplus State property shall identify on the title that the property is in the floodplain or floodway; and disclose all flood hazards when such land is leased or otherwise conveyed of.

e. State agencies developing or assisting with the development of critical infrastructure should avoid approving such development within a floodplain unless it is clearly demonstrated that it is necessary to achieve the purposes of the critical infrastructure and will be operable and not create a hazard to public safety during a major flood event.

4. Each State agency shall prepare a written statement on how it will comply with this Executive Order.

5. The Department of Water Resources shall designate a State Coordinator for Floodplain Management (for NFIP and CRS programs) to coordinate statewide floodplain management efforts including, but not limited to, such activities as:

    a. Provide informational assistance to State agencies, as floodplain management procedures are prepared and before final adoption by each agency to promote adequacy, consistency, and compliance with applicable floodplain regulations, including identification of critical infrastructure.

    b. Encourage and assist State agencies in complying with this Executive Order, including facilitating resolution of situations between or among State agencies, which may have programs with conflicting goals for the floodplain.

6. State Constitutional Officers, the University of California, the California State University, the California Community Colleges, the State Board of Education, State Lands Commission, Trustee Agencies pursuant to Resources Code 21000, and other State agencies, departments, boards, and commissions not directly under the authority of the Executive Branch are encouraged to comply with this Executive Order and the NFIP in a manner consistent with their legal authority.

State agencies and other constitutional entities not covered under the Executive Order are encouraged to consider alternatives that avoid or minimize adverse effects and incompatible development in the floodplain, consistent with their legal authority.

Note 6: *Nothing herein is intended to create a new cause of action against the State.*

IN WITNESS WHEREOF, I have hereunto set my hand and caused the great seal of the State of California to be affixed this _____th day of _____, two thousand and three.

/s/ Gray Davis

(Great Seal of California)
/s/

Governor of California
ATTEST: Secretary of State

APPENDIX D – Proposed Comments on the CEQA Appendix G, Environmental Checklist

Please Note: ***Task Force added comments italicized***

1. Project title: _____

2. Lead agency name and address:
_____
_____

3. Contact person and phone number:
_____

4. Project location:
_____

5. Project sponsor's name and address:
_____
_____
_____

6. General plan designation: _____ 7. Zoning: _____

8. Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)
_____
_____
_____
_____

9. Surrounding land uses and setting: Briefly describe the project's surroundings:
_____
_____
_____
_____

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)
_____
_____
_____
_____

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics ☐ Agriculture Resources ☐ Air Quality

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☐ Biological Resources	☐ Cultural Resources	☐ Geology /Soils
☐ Hazards & Hazardous Materials	☐ Hydrology /*Hydraulics*/ Water Quality	☐ Land Use Planning

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☐ Mineral Resources	☐ Noise	☐ Population / Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities / Service Systems	☐ Mandatory Findings of Significance	

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the applicant. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

_____ _____

Signature Date

_____ _____

Printed name For

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

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2) All answers must take account of the whole action involved, including off-site as well arson-site, cumulative as well as project-level, indirect as well as direct, and construction as wells operational impacts.

3) "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Potentially Significant Unless Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). Earlier analyses are discussed in Section XVII at the end of the checklist.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to previously prepared or outside document should, where appropriate, include a reference tithe page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different ones.

9) The analysis of each issue should identify: a) the significance criteria or threshold used to evaluate each question; and) the mitigation measure identified, if any, to reduce the impact too less than significance.

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SAMPLE QUESTION

Issues:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact

I. AESTHETICS -- Would the project:

a) Have a substantial adverse effect on a scenic vista?

b) Damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within state scenic highway?

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?

II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use? (The Farmland Mapping and Monitoring Programming the California Resources Agency, Department of Conservation, maintains detailed maps of these categories of farmland.)

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

c) Involve other changes in the existing environment, which, due to their location or nature, could individually or cumulatively result in loss of Farmland, to non-agricultural use?

III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

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a) Conflict with or obstruct implementation of the applicable Air Quality Attainment Plan or Congestion Management Plan?

b) Violate any stationary source air quality standard or contribute to an existing or projected air quality violation?

c) Result in a net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

d) Create or contribute to a non-stationary source "hotspot" (primarily carbon monoxide)?

e) Expose sensitive receptors to substantial pollutant concentrations?

f) Create objectionable odors affecting a substantial number of people?

III. BIOLOGICAL RESOURCES -- Would the project:

a) Adversely impact, either directly or through habitat modifications, any endangered, rare, or threatened species, as listed in Title 14 of the California Code of Regulations (sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (sections 17.11 or 17.12)?

b) Have a substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

c) Have a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

d) Adversely impact federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrological interruption, or other means?

e) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?

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f) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

g) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?

IV. CULTURAL RESOURCES -- Would the project:

a) Cause a substantial adverse change in the significance of a historical resource, which is either listed or eligible for listing on the National Register of Historic Places, the California Register of Historic Resources, or a local register of historic resources?

b) Cause a substantial adverse change in the significance of a unique archaeological resources (i.e., an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it contains information needed to answer important scientific research questions, has a special and particular quality such as being the oldest or best available example of its type, or is directly associated with a scientifically recognized important prehistoric or historic event or person)?

c) Disturb or destroy a unique paleontological resource or site?

d) Disturb any human remains, including those interred outside of formal cemeteries?

V. GEOLOGY AND SOILS -- Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?
    ii. Strong seismic ground shaking?
    iii. Seismic-related ground failure, including liquefaction?
    iv. Inundation by seiche, tsunami, or mudflow?
    v. Landslides?
    vi. Flooding, including flooding as a result of the failure of a levee or dam?

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vii. Wild land fires, including where wild lands area adjacent to urbanized areas and where residences are intermixed with wild lands?

a) Would the project result in substantial soil erosion or the loss of tops oil?
b) Would the project result in the loss of a unique geologic feature?
c) Is the project located on strata or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?
d) Is the project located on expansive soil creating substantial risks to life or property?
e) Where sewers are not available for the disposal of wastewater is the soil capable of supporting the use of septic tanks or alternative wastewater disposal systems?

VII. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?
c) Reasonably be anticipated to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?
d) Is the project located on a site, which is included on a list of hazardous materials sites, compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

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h) Expose people or structures to the risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?

VIII. HYDROLOGY, *HYDRAULICS,* AND WATER QUALITY -- Would the project:

a) Violate Regional Water Quality Control Board water quality standards or waste discharge requirements?

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or *alluvial fan apex flow,* in a manner, which would result in substantial erosion or siltation on- or off-site?

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or *alluvial fan apex flow* or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

e) Create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems to control?

~~f)~~ Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other hazard delineation map?

~~g)~~ Place within a 100-year floodplain or *locally adopted floodplain*, structures which would impede or redirect flood flows or *alluvial fan apex flow path*?

h) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of *alluvial fan apex* flow or the failure of a levee or dam?

i) *Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result* of inundation by seiche, tsunami, mudflow, *or alluvial fan apex flow?*

j) *New recommended k): Place structures on alluvial fans and expose other parts of the fan to hazards associated with the relocation of flow paths?*

k) *New recommended l): Place structures in areas subject to other hazards such as seismic activity and fire that would cause significant rapid changes to the hydrology and hydraulics of the watershed and increase the risk of flooding?*

l) Place critical infrastructure within an area subject to flooding?

THERE ARE NO SUGGESTED CHANGES FOR THE REST OF THE CHECKLIST

APPENDIX E - Staff and Consultants

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Abbreviations and Acronyms

BMPs	Best Management Practices
CALFED	The Consortium of State and Federal Agencies with responsibilities in the San Francisco Bay-Sacramento/San Joaquin Delta Bay-Delta Estuary
CEQA	California Environmental Quality Act
CRS	Community Rating System
CWA	Clean Water Act
DFG	Department of Fish and Game
DWR	Department of Water Resources
ESA	Federal Endangered Species Act
FEAT	Federal Emergency Action Team
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPM	Floodplain Management
GIS	Geographic Information System
MOM	Multi-Objective Management
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NRCS	National Resources Conservation Service
OES	Office of Emergency Services
OPR	Office of Planning and Research
SAFCA	Sacramento Area Flood Control Agency
SFHA	Special Flood Hazard Areas
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey